



Project Manual for:

**Kitsap County
Department of Human Services**

PACIFIC BUILDING CONVERSION

4459 SE Mile Hill Dr
Port Orchard, WA 98366

Bid Set
October 23, 2023

Prepared By:
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Bremerton, WA 98337

RICE*fergus***MILLER**
ARCHITECTURE INTERIORS PLANNING VIZLAB

RFM Project No. 2021056.01

PROJECT DIRECTORY

Owner	Kitsap County Department of Human Services 614 Division St., MS -23 Port Orchard, WA 98366-4676 (360) 337-4604	Doug Washburn, Director dwashburn@kitsap.gov Carl Borg, Division Manager ceborg@kitsap.gov Judy-Rae Karlsen, Project Coordinator jrkarlsen@kitsap.gov
Architect	Rice Fergus Miller 275 Fifth Street, Suite 100 Bremerton, WA 98337 (360) 377-8773	Kimberlyn Caoagas, Designer/ Project Coordinator kcaoagas@rfmarch.com
Civil Engineer	NL Olson and Associates 2453 Bethel Rd SE Port Orchard, WA 98366 (360) 876-2284	Ron Johnson, Civil Engineer rjohnson@nlolson.com
Landscape Architect	Lyon Landscape Architects 2111 South C Street Tacoma, WA 98402 (253) 678-4173	Moghan Lyon, Landscape Architect moghan@lyonla.com
MEP Engineer	Sider + Byers 192 Nickerson St #300 Seattle, WA 98109 (206) 285-2966	Jonathan Hall, Mechanical Engineer jonathan@siderbyers.com Bud Reichard, Electrical Engineer bud@advancedelectricalservices.com
Structural Engineer	WSW Engineering PO Box 11678 Bainbridge Island, WA 98110 (206) 402-2906	Bill Williams, Structural Engineer williams@wsweng.com

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SECTION 000 11 13 – INVITATION TO BIDDERS

BID OPENING: Date: **December 6, 2023** Time: **2:00 PM**

SPECIAL FUNDING CONSIDERATIONS

This project is funded in part by:

- US Federal Government – American Recovery Plan Act (ARPA)
- Kitsap County & State of Washington – Community Dev. Block Grant Cares Act (CDBG-CV)
- Kitsap Countywide Coordinated Grant

BID PROCESS

Kitsap County will post all relevant project information, Invitation to Bid, Drawings, Project Manual and Addenda(s) on its website at www.kitsapgov.com/purchasing/bids.htm. It will also post project information in *The Kitsap Sun* and *The Daily Journal of Commerce*.

At bidder's sole expense, project information, drawings and project manuals can be obtained from the American Reprographics Company (ARC) Public Plan Room on their website at <https://customer.e-arc.com/arcEOC/ARCPlanRoom.aspx> or visit their office located at 632 Broadway, Tacoma, WA 98402. Telephone (253) 383-6363 Fax: (253) 272-4064.

Bids delivered in person or by private carrier (UPS, Federal Express, etc.) must be received by Kitsap County Purchasing during business hours Monday – Friday between 8:00 AM and 4:00 PM.

Bids mailed or delivered to Kitsap County shall be addressed to:

Mailing Address

Glen McNeil, Purchasing Supervisor
Kitsap County Purchasing Office
614 Division Street, MS-7
Port Orchard, WA 98366

Physical Address (Drop off or delivery)

Glen McNeil, Purchasing Supervisor
Kitsap County Administration Building
Purchasing Office – 4th Floor
619 Division Street
Port Orchard, WA 98366

Contact Information

Phone: (360) 337-4789
Email: Purchasing@kitsap.gov

BID OPENING

Kitsap County Purchasing Supervisor will publicly open sealed bids on **December 6, 2023 @ 2:00 PM** at the following location:

Kitsap County Administration Building
Commissioners Chambers – 4th Floor
619 Division Street
Port Orchard, Washington 98366

All bids received prior to the deadline will be publicly opened and read aloud. Bids received after the day and time stated above will **not** receive consideration. Kitsap County reserves the right to postpone the Bid opening.

DESCRIPTION OF PROJECT

Existing one (1) story, 20,040 SF former fitness center to be renovated into a new 75 bed co-shelter congregate care living facility for unhoused adults, families and companion animals.

Interior scope includes: Reconfiguration of walls and doors; new MEP systems and associated slab infill to support new shower/toilet facilities, commercial warming kitchen, pet care/kennel rooms, and more; interior finish upgrades throughout, no increase in floor area.

Exterior scope includes: New doors, canopies, exterior lighting, siding replacement, re-roofing, and paint; on-ground and rooftop mechanical equipment; repairs to existing siding systems and fenestrations to remain; infill of wall openings and penetrations.

Site development includes: Frontage improvements, new generator, crease interceptor, remote FCD and precast vault, sewer pump, hardscape, landscape, site lighting, CMU walls, dumpster enclosure; fencing repair/replacement, building and monument sign replacement, parking lot reconfiguration and restriping.

ENGINEER'S ESTIMATE

The Engineer's estimated project construction costs: \$7,300,000.00 to \$8,300,000.00

PRE-BID MEETING - MANDATORY

As a condition of **project** grant funding, a mandatory pre-bid meeting will be held on **November 6, 2023 at 10:00 AM** at the Kitsap County Pacific Building, 4459 SE Mile Hill Drive, Port Orchard, WA 98366. The meeting is intended to provide a review of contract terms and conditions between bidders, owner, and architect prior to bidding the project. Any changes resulting from this conference will be made by Addenda following the meeting. To best comply with current COVID-19 health and safety guidelines, meeting participants are required to adhere to the current Centers for Disease Control and Prevention Guidelines.

CONDITIONS

This project is subject to meet Washington State prevailing wages rates and Federal Labor Standards Provisions Davis Bacon wage laws as explained in HUD form 4010. All work performed on the project will be subject to the approved wage determination rates in the Bid documents. No contract shall be made to parties listed as debarred or suspended in the Federal System for Award Management (SAM).

The work to be performed under this contract is subject to the requirements of section 3 of the Housing and Urban Development Act of 1968, 12 U.S.C. 1701 U (section 3). The purpose of section 3 is to ensure that employment and other economic opportunities generated by HUD assistance shall to the greatest extent feasible, be directed to low-and very low-income persons. Section 3 businesses are encouraged to submit bid proposals.

Kitsap County hereby notifies all bidders that it will affirmatively ensure that in any contract entered into pursuant to the advertisement, Small, Women, and Minority Business Enterprises and labor surplus area firms will be afforded full opportunity to submit bids in response to this Call for Bids and will not be discriminated against on the grounds of race, color, sex, or national origin in consideration for an award. Minority Business Enterprises will be required to meet all requirements of law as related

to Kitsap County contracts, including the provision of the Equal Employment Opportunity and Affirmative Action Plan on the basis of any other bidder.

CONTACT PERSON

All questions from prospective Bidders must be submitted in writing via email to:

Glen McNeill, Purchasing Program Supervisor at: gsmcneill@kitsap.gov.

Substitution Requests must be received no later than seven (7) working days prior to receipt of Bids and will be reviewed by the Architect. Requests received after that time may be considered or rejected at the discretion of the Architect.

Published: October 26, 2023 and November 2, 2023

END OF SECTION 000 11 13

SECTION 000 21 13 – INSTRUCTIONS TO BIDDERS

1.1 DEFINITIONS

- A. All definitions set forth in the General Conditions of the Contract for Construction or in other Contract Documents are applicable to the Bidding Documents.
- B. **“Addenda”** are written or graphic instruments issued by the Architect or the Owner prior to the execution of the Contract which modify or interpret the Bidding Documents by additions, deletions, clarifications or corrections. The contents of Addenda are issued in no particular order and therefore should be carefully and completely reviewed. Addenda relating to administrative matters, such as, for example, the date or time of meetings or Bid receipt, may be issued in writing by fax, mail or other delivery.
- C. An **“Alternate Bid”** (or **“Alternate”**) is an amount stated in the Bid to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, if accepted by the Owner.
- D. **“Award”** means the formal decision by the Owner notifying a Bidder with the lowest Responsive Bid of the Owner’s acceptance of the Bid and intent to enter into a contract with the Bidder. A contract is only formed upon execution of the contract, and not simply by Award.
- E. The **“Award Requirements”** include the following statutory requirements as a condition precedent to Award. The lowest Responsive Bidder shall:
 - (1) have a certificate of registration in compliance with RCW 18.27;
 - (2) have a current state unified business identifier number;
 - (3) if applicable, have industrial insurance coverage for the Bidder’s employees working in Washington as required in Title 51 RCW;
 - (4) have an employment security department number as required in Title 50 RCW;
 - (5) have a state excise tax registration number as required in Title 82 RCW;
 - (6) not be disqualified from bidding on any public works contract under RCW 39.06.010 (unregistered or unlicensed contractors) or RCW 39.12.065(3) (prevailing wage violations);
 - (7) have received training on the requirements related to public works and prevailing wages under chapters 39.04 and 39.12 RCW, or be exempt from such training requirements if the Bidder has completed three or more public works projects and has had a valid business license in Washington for three or more years; and
 - (8) within the three-year period immediately preceding the date of the bid solicitation, not have been determined by a final and binding citation and notice of assessment issued by the department of labor and industries or through a civil judgment entered by a court of limited or general jurisdiction to have willfully violated, as defined in RCW 49.48.082, any provision of chapter 49.46, 49.48, or 49.52 RCW.
- F. The **“Base Bid”** is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base to which work may be added or from which work may be deleted for sums stated in Alternate Bids.

- G. A **“Bid”** is a complete and properly signed proposal to do the Work or designated portion thereof, submitted in accordance with the Bidding Documents, for the sums therein stipulated and supported by any data called for by the Bidding Documents.
- H. A **“Bidder”** is a person or entity who submits a Bid for a prime contract with the Owner for the Work described in the Contract Documents.
- I. The **“Bidding Documents”** include the Advertisement or Invitation to Bid, Instructions to Bidders, the Bid form, any other sample Bidding and contract forms, the Bid Bond, and the Contract Documents, including any Addenda issued prior to receipt of Bids.
- J. The **“Contract Documents”** for the Work consist of the Agreement Between Owner and Contractor, the General Conditions of the Contract (as well as any Supplemental, Special or other Conditions included in the Project Manual), the Drawings, the Specifications, and all Addenda issued prior to, and all modifications issued after, execution of the Contract.
- K. The **“Owner”** is Kitsap County Department of Human Services.
- L. To be considered **“Responsible”** or meet **“Responsibility”** requirements, a Bidder must meet the following supplemental criteria applicable to this Project to the satisfaction of the Architect and the Owner:
- (1) The ability, capacity, and skill to perform the Contract;
 - (2) The character, integrity, reputation, judgment, experience, and efficiency of the Bidder;
 - (3) Whether the Bidder can perform the Contract within the time specified;
 - (4) The previous and existing compliance by the Bidder with laws relating to the Contract;
 - (5) The quality of performance of previous contracts, including demonstration of successful completion of similar projects of equal or greater size, scope and value in the last three (3) years;
 - (6) The designated Project Manager shall have a minimum of five (5) years of successful experience in project management and scheduling of projects of similar scope and complexity;
 - (7) The designated Superintendent shall have a minimum of five (5) years of successful supervision of projects of similar scope and complexity;
 - (8) Any other qualifications required by the Contract Documents or Bidding Documents; and
 - (9) Attend the mandatory Pre-Bid and Pre-Construction meetings.
 - (10) Such other information as may be secured having a bearing on the decision to award the contract.
- M. A **“Sub-bidder”** is a person or entity who submits a bid to a Bidder for materials, equipment or labor for a portion of the Work.
- N. A **“Unit Price”** is an amount stated in the Bid as a price per unit of measurement for materials, equipment or services as described in the Bidding Documents or in the Contract Documents. The Owner reserves the right to reject at any time, without impairing the balance of the proposal, any or all such predetermined unit prices.

1.2 BIDDER'S REPRESENTATIONS

By making its Bid, each Bidder represents that:

- A. BIDDING DOCUMENTS. The Bidder has read and understands the Bidding Documents, and its Bid is made in accordance with them.
- B. POSSIBLE SELF-PERFORMED WORK REQUIREMENT. The Bidder will perform *with its own forces* at least that percentage (if any) of the Work required by the Bidding Documents or the Contract Documents.
- C. PRE-BID MEETING. The Bidder has attended the mandatory pre-bid meeting(s) required by the Owner in the Bidding Documents.
- D. BASIS. Its Bid is based upon the materials, systems, services, and equipment required by the Bidding Documents, without exception.
- E. EXAMINATION. The Bidder has carefully examined and understands the Bidding Documents, the Contract Documents (including, without limitation, any liquidated damages and insurance provisions), and the Project site, including any existing buildings, it has familiarized itself with the local conditions under which the Work is to be performed and has correlated its observations with the requirements of the Contract Documents and it has satisfied itself as to the nature, location, character, quality and quantity of the Work, the labor, materials, equipment, goods, supplies, work, services and other items to be furnished, and all other requirements of the Contract Documents. The Bidder has also satisfied itself as to the conditions and other matters that may be encountered at the Project site or affect performance of the Work or the cost or difficulty thereof, including but not limited to those conditions and matters affecting: transportation, access, disposal, handling and storage of materials, equipment and other items; availability and quality of labor, water, electric power and utilities; availability and condition of roads; climatic conditions and seasons; physical conditions at the Project site and the surrounding locality; topography and ground surface conditions; and equipment and facilities needed preliminary to and at all times during the performance of the Work. The failure of the Bidder fully to acquaint itself with any applicable condition or matter shall not in any way relieve the Bidder from the responsibility for performing the Work in accordance with, and for the Contract Sum and within the Contract Time provided for in, the Contract Documents.
- F. PROJECT MANUAL. The Bidder has checked their copies of the Project Manual with the Table of Contents bound therein to ensure the Project Manual is complete.
- G. SEPARATE WORK. The Bidder has examined and coordinated all Drawings, Contract Documents, and Specifications for any other contracts to be awarded separately from, but in connection with, the Work being bid upon, so that the Bidder is fully informed as to conditions affecting the Work under the contract being bid upon.
- H. LICENSE REQUIREMENTS. Bidders and their proposed Subcontractors shall be registered and shall hold such licenses as may be required by the laws of Washington, including RCW 18.27, for the performance of the Work specified in the Contract Documents.

- I. NO EXCEPTIONS. Bids must be based upon the materials, systems and equipment described and required by the Bidding Documents, and terms and conditions in the Contract Documents, without exception.

1.3 BIDDING DOCUMENTS

A. COPIES

1. **Deposit.** Bidders may obtain complete sets of the Bidding Documents from the issuing office and other locations designated in the Advertisement or Invitation to Bid in the number and for the deposit amount, if any, stated. The deposit (if any) will be refunded to Bidders who submit a bona fide Bid and return the Bidding Documents in good condition within ten (10) days after receipt of Bids. The cost of replacement of any missing or damaged documents will be deducted from the deposit. A Bidder awarded a Contract may retain the Bidding Documents, and its deposit will be refunded.
2. **Sub-bidders.** Bidding Documents will not be issued directly to Sub-bidders or others unless specifically offered in the Advertisement or Invitation to Bid.
3. **Complete sets.** Bidders shall use complete sets of Bidding Documents in preparing Bids and are solely responsible for utilizing established plan holder identification processes to obtain updated bid information; neither the Owner nor the Architect assumes any responsibility for errors or misinterpretations resulting from the use of incomplete and/or superseded sets of Bidding Documents. Printed copies of plans take precedence over any on-line images.
4. **Conditions.** The Owner and/or the Architect make copies of the Bidding Documents available on the above terms only for the purpose of obtaining Bids on the Work and do not confer a license or grant permission for any other use.
5. **Legible Documents.** To the extent any drawings, specifications, or other Bidding documents are not legible, it is the Bidder's responsibility to notify the Owner and the Architect and to obtain legible documents from the plan center.

B. INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

1. **Format.** The Contract Documents may be divided into parts, divisions, and sections for convenient organization and reference. Generally, there has been no attempt to divide the Specification sections into Work performed by the various building trades, any Work by separate contractors, or any Work required for separate facilities in or phases of the Project.
2. **Notify Owner and Architect.** Bidders and Sub-bidders shall promptly notify the Owner and the Architect in writing of any ambiguity, inconsistency, or error that they may discover upon examination of the Bidding Documents or of the site and local conditions. All Bidders and Sub-bidders shall thoroughly familiarize themselves with specified products and installation procedures and submit to the Owner and the Architect any objections (in writing) no later than seven (7) calendar days prior to the Bid Date. The submittal of the Bid constitutes acceptance of products and procedures specified as sufficient, adequate, and

satisfactory for completion of the Contract.

3. **Written request.** Bidders and Sub-bidders requiring clarification or interpretation of the Bidding Documents shall make a written request which shall reach the admin@barkercreeks.com at least seven (7) calendar days prior to the date for receipt of Bids.
4. **Addenda.** Any interpretation, correction or change of the Bidding Documents will be made by written Addendum. Interpretations, corrections or changes of the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely upon such interpretations, corrections and changes.
5. **Singular references.** Reference in the singular to an article, device, or piece of equipment shall include as many of such articles, devices, or pieces as are indicated in the Contract Documents or as are required to complete the installation.
6. **Utilities and runs.** The Bidder should assume that the exact locations of any underground or hidden utilities, underground fuel tanks, and any plumbing and electrical runs may be somewhat different from any location indicated in the surveys or Contract Documents.
7. **Division of Contract Documents.** The Contract Documents may be divided into parts, divisions, and sections for convenient organization and reference. Generally, there has been no attempt to divide the Specification sections into Work performed by the various building trades, any Work by separate contractors, or any Work required for separate facilities in of phases of the Project.

C. SUBSTITUTIONS

1. **Standard.** The materials, products, procedures and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance, and quality that must be met by any proposed substitution.
2. **Substitution procedure.** No substitution will be considered prior to receipt of Bids unless the Architect receives a written request for approval on the Architect's Substitution Request form for the Project, with all data requested on the form completed, at least seven (7) days prior to the date for receipt of Bids. Each such request shall be submitted with a Request for Substitution form identical to or equivalent in content to the form found in the Project Manual, and shall include the name of the material or equipment proposed to be replaced and a complete description of the proposed substitute, including drawings, cuts, performance and test data, warranty information, and any other information necessary for an evaluation. A statement setting forth any changes in other materials, equipment or other Work that incorporation of the substitute would require shall be included. The proposer has the burden to prove the merit of the proposed substitute; by proposing the substitution, the Bidder represents that it has personally investigated the proposed material or product and determined that it is equal or better in all respects to that specified, that the same or better warranty will be provided for the substitution, that complete cost data, including all direct and indirect costs of any kind, has been presented, that the Contract Time will not be increased, and that it will coordinate the installation of the substitute if accepted and

- make all associated changes in the Work. The Architect's decision to approve or disapprove a proposed substitution shall be final. Written requests for approval shall constitute a guarantee by the Bidder that the articles or materials are in all respects, including warranty and installation, equal or superior to those specified, unless otherwise noted. To the extent the proposed substitution will require additional services by the Architect or its consultants after Bid award, the Bidder, if successful, will be required to pay the Architect or its consultants for these services at their customary hourly rates.
3. **Addendum.** If the Architect approves a proposed substitution prior to receipt of Bids, the approval will be set forth in a written Addendum. Bidders shall not rely upon approvals made in any other manner. Substitution request forms returned by the Architect are a courtesy only, and Bidders/Sub-bidders shall rely solely on substitution approvals listed in an Addenda.
 4. **Post-Bid substitutions.** After the Contract has been executed, the Owner and the Architect may consider a written request for the substitution of material or products in place of those specified in the Contract Documents only under the circumstances as specified therein.

D. ADDENDA

1. **Written.** All Addenda will be written. They will be posted electronically with notice to those known to have received a complete set of Bidding Documents.
2. **Copies.** Copies of Addenda will be made available for inspection wherever Bidding Documents are on file for that purpose.
3. **Verification and acknowledgment of receipt.** Prior to bidding, each Bidder shall ascertain that it has received all Addenda issued. Each Bidder shall acknowledge its receipt of all Addenda in its Bid.

1.4 BIDDING PROCEDURE

A. FORM AND STYLE OF BIDS

1. **Form.** Bids (including any required attachments) shall be submitted on forms identical to the form included with the Bidding Documents. Bids on different forms may be rejected. No oral, email, or telephonic responses or modifications will be considered to be Bids.
2. **Entries on the Bid form.** All blanks on the Bid form shall be filled in by typewriter or manually in ink.
3. **Words and figures.** Where so indicated by the makeup of the Bid form, sums shall be expressed in both words and figures; in case of discrepancy between the two, and regardless of any statement to the contrary on the Bid form, *the amount written in figures shall govern and the words shall be used to determine any ambiguities in the figures.* Portions of the Bid form may require the addition of component bids to a total or the identification of component amounts within a total. In case of discrepancy between component amounts

listed and their sum(s), the component amounts listed shall govern.

4. **Initial changes.** Any interlineation, alteration or erasure must be initialed by an authorized representative of the Bidder.
5. **Alternates and Unit Prices.** All requested Alternates and unit prices should be bid. The Owner reserves the right, but is not obligated, to reject any Bid on which all requested Alternates or unit prices are not bid. If no change in the Base Bid is required for an Alternate, enter “*No Change.*” If there is no entry, it will be presumed that the Bidder has made no offer to accomplish this Alternate. If it is not otherwise clear from the Bid or nature of the Alternate, it will be presumed that the amount listed for an Alternate is an add rather than a deduct.
6. **No conditions.** The Bidder shall make no conditions or stipulations on the Bid form nor qualify its Bid in any other manner.
7. **Identity of Bidder.** The Bidder shall include in the specified location on the Bid form the legal name of the Bidder and, if requested, a description of the Bidder as a sole proprietor, a partnership, a joint venture, a corporation (including the state of incorporation), or another described form of legal entity. The Bid shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid submitted by an agent shall have a current power of attorney attached certifying the agent’s authority to bind the Bidder, and provide other information requested.
8. **Bid amounts do not include sales tax.** The Bid shall include in the sum stated all taxes imposed by law, EXCEPT STATE AND LOCAL SALES TAX ON THE CONTRACT SUM.
9. **Bid breakdown.** The Bid form may contain, for the Owner’s accounting purposes only, a breakdown of some or all of the components included in the Base Bid.

B. POTENTIAL LISTING OF SUBCONTRACTORS

1. **Procedure.** On certain projects of the Owner, the Bid form includes a requirement that certain Subcontractors be listed, and the list must be submitted to the Owner as described in the bidding documents. In these circumstances, the Bidder must name the Subcontractor with whom the Bidder, if awarded the Contract, will subcontract **directly** (i.e., not lower-tier Subcontractors) for performance of the work of:
 - (a) HVAC (heating, ventilation and air conditioning),
 - (b) plumbing as described in RCW 18.106,
 - (c) electrical work as described in RCW 19.28,
 - (d) structural steel installation,
 - (e) rebar installation, and
 - (f) any other categories of Work listed on the Subcontractor listing form(s).

TIMING: The listing of HVAC, plumbing, and electrical subcontractors shall occur within one hour of the published bid submittal time. The listing of structural steel installation and rebar

installation subcontractors shall occur within forty-eight hours of the published bid submittal time. The listing of any other categories of Work listed on the Subcontractor listing form(s) shall occur as indicated on such forms or as otherwise described in the bidding documents.

SELF-PERFORMANCE: If the Bidder intends to self-perform any of these categories of Work, it must name itself for each such category of Work.

IF NO SUBCONTRACTORS: If there is no work to be performed by a HVAC, plumbing, electrical, structural steel installation, rebar installation, or other subcontractor category identified on the Bid form(s), the Bidder should insert "None" or "N/A" on the Bid form. If a category is left blank, that shall indicate that the Bidder believes that there is no Work to be performed by that trade.

MULTIPLE ENTRIES: The Bidder shall not list more than one (1) entity for a particular category of Work identified, unless a Subcontractor varies with an Alternate Bid, in which case the Bidder shall identify the Subcontractor to be used for the Alternate and the affected portion of the Work and otherwise make its Bid clear as to which subcontractor shall be utilized depending upon the selection of alternates.

MULTIPLE SUBMITTAL TIMES. In the event the Bidding Documents call for a second submittal time for receipt of alternate bids, and no additional Subcontractors are listed with such alternate bids, the Owner will consider that there is no change in the Subcontractors from those listed with regard to the base Bid.

2. **Failure to Submit.** In accordance with RCW 39.30.060, failure of a Bidder to submit the names of such proposed heating, ventilation and air conditioning, plumbing, electrical, structural steel installation, and rebar installation Subcontractors or to name itself to perform such Work or the naming of two or more Subcontractors to perform the same Work in the time periods described above shall render the Bidder's Bid nonresponsive and, therefore, void.
3. **Requirement to Subcontract.** The Bidder, if awarded the Contract, will subcontract with the listed Subcontractor for performance of the portion of the Work designated on the Form of Proposal, subject to the provisions of the Contract for Construction and RCW 39.30.060. The Bidder shall not substitute a listed Subcontractor in furtherance of bid shopping or bid peddling.
4. **Replacement.** If a listed Subcontractor is unable to comply with any bondability, qualification, or other requirements of the Contract or Bidding Documents (including without limitation a finding of Subcontractor non-Responsibility), the Owner may require the Bidder to replace the Subcontractor with a Subcontractor acceptable to the Owner at no change in the Contract Sum or Contract Time.
5. **Subcontractor Standards.** Subcontractors shall meet contractual and technical qualifications standards, and provide specialized certification, licensing, and/or payment and performance bonding where specified.

C. BID SECURITY

1. **Purpose and procedure.** Each Bid shall be accompanied by a bid security payable to the Owner in the form required in the Bidding Documents and equal to five percent (5%) of the Base Bid. The bid security constitutes a pledge that the Bidder will enter into the Contract with the Owner in the form provided, in a timely manner, and on the terms stated in its Bid and will furnish in a timely manner the payment and performance bonds, certificates of insurance, Contractor's Construction Schedule, and all other documents required in the Contract Documents. Should the Bidder fail or refuse to enter into the Contract or fail to furnish such documents, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. By submitting its Bid and bid security, the Bidder agrees that any forfeiture is a reasonable prediction at the time of Bid submittal of future damages to the Owner.
2. **Form.** The bid security shall be in the form of a certified or bank cashier's check payable to the Owner or a bid bond executed by a bonding company acceptable to the Owner and licensed in the State of Washington on the form included with the Bidding Documents (if any) or on an acceptable and equivalent form. The Attorney-in-Fact who executes the bond on behalf of the surety shall be licensed to do business in the State of Washington and shall affix to the bond a certified and current copy of his or her Power of Attorney.
3. **Retaining Bid Security.** The Owner will have the right to retain the Bid Security of Bidders to whom an award is being considered until the earliest of either (a) the Contract has been executed, and payment and performance bonds have been furnished, or (b) the specified time has elapsed so that Bids may be withdrawn, or (c) all Bids have been rejected.
4. **Return of Bid Security.** Within sixty (60) days after the Bid Date, the Owner will release or return Bid securities to Bidders whose Bids are not to be further considered in awarding the Contract. Bid securities of the three apparent low Bidders will be held until the Contract has been finally executed, after which all unforfeited Bid securities will be returned.

D. SUBMISSION OF BIDS

1. **Procedure.** The Bid, the Bid security, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the party specified in the Advertisement or Invitation to Bidders and shall be identified with the Bid number and submittal date. If the Bid is sent by mail the sealed envelope shall be enclosed in a separate mailing envelope with the notation "*SEALED BID ENCLOSED*" on the face thereof.
2. **Deposit.** Bids shall be deposited at the designated location prior to the time and date for receipt of Bids indicated in the Advertisement or Invitation to Bid, or any extension thereof made by Addendum. Bids received after the time and date for receipt of Bids may be opened, retained unopened, or returned (open or unopened), all at the discretion of the Owner.

3. **Responsibility.** The Bidder assumes full responsibility for timely delivery at the location designated for receipt of Bids.
4. **Form.** Oral, fax, telephonic, email, electronic, or telegraphic Bids are invalid and will not be considered.

E. MODIFICATION OR WITHDRAWAL OF BID

1. **After receipt time.** A Bid may not be modified, withdrawn or canceled by the Bidder during a sixty (60) day period following the time and date designated for the receipt of Bids, and each Bidder so agrees by virtue of submitting its Bid.
2. **Before receipt time.** Prior to the time and date designated for receipt of Bids, any Bid submitted may be modified or withdrawn only by notice to the party receiving Bids at the place designated for receipt of Bids. Such notice shall be in writing over the signature of the Bidder or by email or fax; if by email or fax, written confirmation over the signature of the Bidder shall be mailed and postmarked on or before the date and time set for receipt of Bids. The notice shall be worded so as not to reveal the amount of the original Bid. Email notice will not be considered. It shall be the Bidder's sole responsibility to verify that the notice has been received by the Owner in time to be withdrawn before the Bid opening.
3. **Resubmittal.** Withdrawn Bids may be resubmitted up to the time designated for the receipt of Bids provided that they are then fully in conformance with these Instructions to Bidders.
4. **Bid security with resubmission.** Bid security shall be in an amount sufficient for the Bid as modified or resubmitted.

F. NOTICE

1. Notice or a request from a Bidder under these Instructions to Bidders must be in writing over the signature of the Bidder and delivered in person or by mail, express delivery, email or fax. If the notice is by email or fax, written confirmation over the signature of the Bidder must be mailed and postmarked on or before the date and time set for the notice.

1.5 CONSIDERATION OF BIDS

- A. **OPENING OF BIDS:** Unless stated otherwise in the Advertisement or Invitation to Bid or any Addendum, the properly identified Bids received on time will be opened publicly and will be read aloud. An abstract of the Base Bids and Alternate Bids, if any, will be made available to Bidders and other interested parties.
- B. **REJECTION OF BIDS:** The Owner shall have the right but not the obligation to reject any or all Bids for any reason or for no reason, to reject a Bid not accompanied by required Bid security or by other material or data required by the Bidding Documents, or to reject a Bid which is in any way incomplete or irregular.
- C. **ACCEPTANCE OF BID (AWARD)**

1. **Owner.** The Owner intends (but is not bound) to award a Contract to the lowest Responsible and Responsive Bidder, provided the Bid has been submitted in accordance with the requirements of the Bidding Documents and does not exceed the funds available. The Owner has the right to waive any informality or irregularity in any Bid(s) received and to accept the Bid which, in its judgment, is in its own best interests.
2. **Alternates.** The Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Contract Documents or Bidding Documents, and to determine the low Bidder on the basis of the sum of the Base Bid and the Alternates (if any) accepted. The Owner retains the right to accept Alternate Bid items at the price bid within sixty (60) days after the Agreement is executed.
3. **Requirements for Award.** Before the Award, the lowest Responsive Bidder shall meet the Award Requirements.

D. BID PROTEST PROCEDURES

1. **Procedure.** A Bidder protesting for any reason the Bidding Documents; a bidding procedure; the Owner's objection to the Bidder or a person or entity proposed by the Bidder, including but not limited to a finding of non-Responsibility; the rejection of a Bid; the award of the Contract; or any other aspect arising from or relating in any way to the bidding or award or lack thereof, shall cause a written protest to be filed with the Owner within two (2) business days of the event giving rise to the protest and, in any event, no later than two (2) business days after the date upon which Bids are opened. (Intermediate Saturdays, Sundays, and legal holidays are not counted.) The written protest shall include the name of the protesting Bidder, a detailed description of the specific factual and legal grounds for the protest, copies of all supporting documents, and the specific relief requested. The written protest shall be delivered to:

Glen McNeil, Purchasing Supervisor
Kitsap County Purchasing Division
614 Division Street MS-7
Port Orchard, Washington, 98366
Purchasing@kitsap.gov

2. **Consideration.** Upon receipt of the written protest, the Owner will consider the protest. The Owner may, within three (3) business days of the Owner's receipt of the protest, provide any other affected Bidder(s) the opportunity to respond in writing to the protest. If the protest is not resolved by mutual agreement of the protesting Bidder and the Owner, the Superintendent of the Owner or his or her designee will review the issues and promptly furnish a final and binding written decision to the protesting Bidder and any other affected Bidder(s) within six (6) business days of the Owner's receipt of the protest. (If more than one (1) protest is filed, the Owner's decision will be provided within six (6) business days of the Owner's receipt of the last protest.) If no reply is received from the Owner during the six (6) business-day period, the protest shall be deemed rejected.

3. **Waiver.** Failure to comply with these protest procedures will render a protest waived.
4. **Condition precedent.** Timely and proper compliance with and exhaustion of these protest procedures shall be a condition precedent to any otherwise permissible judicial consideration of a protest.

1.6 POST BID INFORMATION

A. INFORMATION FROM APPARENT LOW BIDDER

1. **Submittal.** Within forty-eight (48) hours of the Architect's request, the apparent low Bidder and any other Bidders so requested shall submit the following to the Architect and Owner:
 - (a) additional information regarding the use of their own forces and the use of subcontractors and suppliers, if requested by Owner;
 - (b) a properly executed Contractor's Qualification Statement on the form provided (unless otherwise required to be submitted at the time of the Bid);
 - (c) a letter or form from the Bidder's insurance company stating that the insurance required by the Contract Documents will become effective upon execution of the Contract;
 - (d) a letter or form from the Bidder's surety stating that the bond(s) required by the Contract Documents will become effective upon execution of the Contract;
 - (e) if requested by the Owner, a detailed breakdown of the Bid in a form acceptable to the Owner; and
 - (f) a signed statement in accordance with RCW 9A.72.085 verifying under penalty of perjury that the bidder is in compliance with the responsible bidder criteria of RCW 39.04.350(1)(g).

Failure to provide any of the above information in a timely manner may constitute an event of breach permitting forfeiture of the Bid security.

2. **Responsibility.** The Bidder will be required to establish to the satisfaction of the Architect and the Owner the reliability and Responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents as well as qualifications set forth in the Sections of the Project Manual pertaining to such proposed Subcontractor's respective trades. The Responsibility of the Bidder may be judged in part by the Responsibility of these proposed entities. The following will be considered:
 - (a) The ability, capacity, and skill to perform the contract;
 - (b) The character, integrity, reputation, judgment, experience, and efficiency of the Bidder;
 - (c) Whether the Bidder can perform the contract within the time specified;
 - (d) The quality of performance of previous contracts;
 - (e) The previous and existing compliance by the Bidder with laws relating to the contract; and
 - (f) Such other information as may be secured having a bearing on the decision to award the contract.

CONSIDERATION. In considering a Bidder's Responsibility, a Bidder shall be deemed to be unqualified to perform the Contract if, after review and verification of the representations included upon the Contractor's Qualification Statement submitted by the Bidder, conditions such as, but not limited to, the following appear:

- (a) The Bidder does not have sufficient prior experience (or an acceptable substitute thereof, as described below) with projects of a similar nature in technical, managerial, and financial requirements to that in the present Contract being bid. In addition to such established contractors, a newly established contractor may be considered qualified if it has shown on the Contractor's Qualification Statement that it is staffed with sufficient technical, managerial, and financial personnel with prior experience in the nature of construction for which the Bids are invited.
 - (b) The Bidder does not have sufficient capability to undertake the obligations of the Contract. A determination will be made when the Owner's review of the probable cash flow needs of the Bidder for this Project (including payroll, cost of material and supplies, equipment rental costs, and any other direct or incidental costs of the Contract), concludes that the Bidder does not have sufficient financial resources to enable it to satisfy its financial obligations under the Contract.
 - (c) The Bidder has submitted unrealistic unit prices as determined by other Bidders' unit prices for this Project.
 - (d) The Bidder does not have sufficient staff, equipment, or plant available to perform the Contract. The Owner's determination in this matter will be based upon that represented by Bidder in the Contractor's Qualification Statement.
 - (e) The Bidder has a history of unsatisfactory performance of contracts of this or similar nature, regardless of whether such contracts existed between the Owner and the Bidder, or other parties.
 - A determination of this nature will be made if the Owner, after review of the Bidder previous work experience, determines that the Bidder's unsatisfactory performance has resulted predominantly from the Bidder's failure rather than a failure to perform by another party. The Owner will give the Contractor an opportunity to explain such nonperformance's before any final determination is reached.
 - A determination of failure to perform will be made if the Owner is satisfied after review of the Bidder's prior experience, that the Bidder has failed to satisfy its obligations under past contracts and the Owner cannot safely assume satisfactory performance of the Contract by the Bidder.
 - In reaching its determination, the Owner may consider statements of other parties to the prior unperformed contracts, as well as the representations of the Bidder on its Contractor's Qualification Statement.
3. **Subcontractors.** The Responsibility of the Bidder may be judged in part by the Responsibility of its Subcontractors. Bidders must verify Responsibility criteria for each first-tier Subcontractor. A Subcontractor of any tier that hires other Subcontractors must verify Responsibility criteria for each of its next lower-tier Subcontractors. Verification shall include that each Subcontractor, at the time of subcontract execution, is Responsible and

possesses an electrical contractor license, if required by RCW 19.28, or an elevator contractor license, if required by RCW 70.87, and can obtain any payment and performance bonds required by the Bidding or Contract Documents.

4. **Request to Modify Criteria.** No later than ten (10) days prior to the Bid Date, a potential Bidder may request in writing that the Owner modify the Responsibility criteria listed in clause (2) above or elsewhere in the Contract Documents or the Bidding Documents. The Owner will evaluate the information submitted by the potential Bidder and respond before the Bid Date. If the evaluation results in a change of the criteria, the Owner will issue an Addendum identifying the new criteria.
 5. **Objection.** Prior to the Award of the Contract, the Architect will notify the Bidder in writing if either the Owner or the Architect, after due investigation, has reasonable objection to the Bidder or a person or entity proposed by the Bidder, and the Owner will provide the reasons for the determination. The Bidder may appeal the determination within two (2) business days of its receipt of the objection by presenting additional information to the Owner, and the Owner will consider the additional information before issuing its final determination. The Bidder may, after the Owner's objection or determination, and at Bidder's option, (1) withdraw the Bid, (2) submit an acceptable substitute person or entity with no change in the Contract Time and no adjustment in the Base Bid or any Alternate Bid, even if there is a cost to the Bidder occasioned by the substitution, or (3) appeal by filing a protest in accordance with paragraph 1.05(D). In the event of withdrawal, Bid security will not be forfeited.
 6. **Change.** Persons and entities proposed by the Bidder and to whom the Owner or the Architect have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner and the Architect.
 7. **Right to Terminate.** The Bidder's representations concerning its qualifications will be construed as a covenant under the Contract. Should it appear that the Bidder has made a material misrepresentation on its Contractor's Qualification Statement, the Owner shall have the right to terminate the Contract for cause for the Contractor's breach, and the Owner may then pursue such remedies as exist elsewhere under this Contract, or as otherwise are provided at law or equity.
- B. **INFORMATION FROM OTHER BIDDERS:** All other Bidders designated by the Architect as under consideration for award of a Contract shall also provide a properly executed Contractor's Qualification Statement, if so requested by the Owner.
- C. **BIDDING MISTAKES:** The Owner will not be obligated to consider notice of claimed bidding mistakes received more than three (3) business days after the Bid opening. In accordance with Washington law, a low Bidder that claims error and fails to enter into the Contract is prohibited from bidding on the Project if a subsequent call for Bids is made for the Project.

1.7 PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND

- A. **BOND REQUIREMENTS:** Within forty-eight (48) hours after the issuance of the Owner's notice of

intent to award the Contract, and prior to the date of execution of the Contract, the Bidder shall furnish evidence satisfactory to the Owner of its ability to obtain statutory bonds pursuant to RCW 39.08 covering the faithful performance of the Contract and the payment of all obligations arising thereunder in the form prescribed in the Contract Documents and in the full amount of the Contract Sum plus sales tax. The cost of such bond shall be included in the Base Bid.

- B. **TIME OF DELIVERY AND FORM OF BONDS.** The Bidder shall deliver the bonds and other documents required by the Contract Documents (including but not limited to certificates of insurance) to the Owner pursuant to the Contract Documents and in no event any later than seven (7) days after the date of execution of the Contract and prior to commencing operations at the site. The bonds shall be written in the form approved by the Owner for public work, as required by RCW 39.08. The bonds shall be written by a surety firm licensed to do business in the State of Washington, with an A.M. Best rating of at least A-/VII. The Bidder shall require the Attorney-in-Fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of his/her Power of Attorney.

1.8 FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

- A. **FORM TO BE USED:** The Agreement for the Work will be written on the form(s) contained in the Bidding Documents, including any General, Supplemental or Special Conditions, and the other Contract Documents included with the Project Manual. In the event no form is enclosed, an AIA Document A101-2017, "Standard Form of Agreement Between Owner and Contractor, where the basis of payment is a Stipulated Sum," along with the General Conditions (AIA Document A201-2017), as both are revised, modified and supplemented by the Owner, will be used. All references in these Instructions to Bidder to the A101 or the A201 refer to the documents as revised by the Owner.
- B. **CONFLICTS:** In case of conflict between the provisions of these Instructions and any other Bidding Document, these Instructions shall govern. In case of conflict between the provisions of the Bidding Documents and the Contract Documents, the Contract Documents shall govern.

1.9 CONTRACT DOCUMENTS

This paragraph contains descriptions of some but not all of the provisions of the Contract Documents.

- A. **RETAINAGE:** The Contract Documents specify the statutory retainage requirements of RCW 60.28 for this Project.
- B. **CONTRACT TIME:** The Contract Documents specify the Contract Time. Timely completion of this Project is essential to the Owner.
- C. **PREVAILING WAGES:** The Contract Documents contain requirements regarding the payment of prevailing wages pursuant to RCW 39.12.
- D. **WRITTEN CLAIMS AND NOTICE:** The Contract Documents contain a number of provisions that require the Contractor to provide notice of Claims and to make and support Claims, in writing, within a specified time in order to maintain the Claim. The Owner is under no obligation to

consider Claims that fail, in any respect, to meet these requirements.

- E. CHANGES IN CONTRACT SUM: The Contract Documents contain provisions specifying requirements for and pricing of changes in the Contract Sum.
- F. DISPUTE RESOLUTION: The Contract Documents contain provisions replacing the arbitration provisions of the form General Conditions with an alternative dispute resolution procedure which, among other things, requires non-binding mediation of all disputes.
- G. CONTRACTOR REGISTRATION: Pursuant to RCW 39.06, the Bidder shall be registered or licensed as required by the laws of the State of Washington, including but not limited to, RCW 18.27.
- H. TAXES. The Contractor shall include in its Bid and pay for all applicable taxes except Washington State Sales Tax and Local Sales Tax on the Contract Sum, which shall be excluded in the preparation of its Bid. Such State and Local Sales Taxes shall be added to the Contract Sum, paid by the Owner to the Contractor, and then paid by the Contractor over the course of the Project. Refer to general, supplementary or other conditions regarding further information.
- I. OTHER PROVISIONS: The above paragraphs contain descriptions of some but not all of the provisions of the Contract Documents. Bidders should review in detail the Contract Documents themselves and not rely upon the above paragraphs in this article as complete or inclusive.

1.10 POSSIBLE TRENCH EXCAVATION SAFETY PROVISIONS

- A. To ensure that the Bidder agrees to comply with relevant trenching safety requirements of RCW 39.04.180 and RCW 49.17, the Base Bid must include the cost of any required trench safety provisions. The Bidder shall enter in the blank provided on the Bid form the dollar amount the Bidder has included in its Base Bid for any trench safety provisions for trenching that will exceed a depth of four feet. If trench excavation safety provisions do not pertain to the Project, the Bidder may enter "N.A." or "Not Applicable" in the blank on the Bid form.

END OF SECTION 000 21 13

SECTION 000 31 00 – AVAILABLE PROJECT INFORMATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes Information regarding existing conditions at the project site.

Project Summary

Kitsap County Department of Human Services Department has submitted an application for an Administrative Conditional Use Permit to Kitsap County Department of Community Development for the Pacific Building Conversion project. This project will change the existing land use designation, upgrade the site, and re-purpose the existing facility into a residential shelter facility with staffing and supportive services.

Kitsap County Human Services will use the existing building and will request a change in categorical use to “Group Living”. As a shelter facility, it will operate 24 hours/7 days a week with access restricted to guests, staff, and service providers.

The Pacific Building Project is located at 4459 SE Mile Hill Drive in Port Orchard, WA. Two existing parcels are associated with the project and total 4.17 acres in size. The properties have been previously developed with an approximately 20,040 square foot (sf) building, utilities, parking areas, frontage sign, landscaping, fencing, lighting, a dual pump sewer pump station and a stormwater detention pond. The two parcels associated with the project development are Parcels 302402-4-144-2009 and 302402-4-214-2004. Both parcels are zoned Urban High Intensity Commercial. A third adjacent parcel is also owned by Kitsap County, Parcel Number 302402-4-193-2009, but will not be included with this project.

Property Description

The properties purchased by Kitsap County consists of three parcels of land encompassing a total of 4.68 acres located in the southeast quarter of Section 30, Township 24N, Range 2E of unincorporated Kitsap County, Washington. The tax identification of the parcels and related property information are as follows:

1. Parcel 302402-4-144-2009 [2.75 acres] Zoning: Commercial 10-30 DU/Ac Property Use - 740 Recreational Use
2. Parcel 302402-4-214-2004 [1.42 acres] Zoning: Commercial 10-30 DU/Ac Property Use - 910 Undeveloped Land (Stormwater pond & access)
3. Parcel 302402-4-193-2009 [0.51 acres] Zoning: Commercial 10-30 DU/Ac Property Use - 910 Undeveloped Land (Parcel not developed with project)

Site Plan Design

The proposed project site design includes proposed open space and amenities on the North side of the existing building. The open space area will include perimeter fencing. The existing mature

landscaping vegetation will generally remain. Any existing landscape buffer will also remain. Amenities within the open space will include pathways, gazebo structures and a pet area.

The site area South of the existing building will remain as developed for the most part with an effort to retain the large trees and park-like setting. Original property buffer of healthy mature cedar, fir, alder and madrona trees will remain intact. The existing paved parking area will be restriped and continue to function as onsite parking. Required handicapped accessible parking spots and an entry ramp will be incorporated into the site design. Signage at the Mile Hill Drive property entrance will be updated.

The site area on the east side of the building include building entrance will remain generally intact. The handicapped parking area will be regraded and resurfaced to ensure current ADA compliance. The remaining area at the building front will be designated a loading zone for deliveries, service providers, and emergency vehicles. Two 50 amp outlets are also proposed in this area for service providers mobile units.

Building Designs

Kitsap County has plans to redesign portions of the existing building in the Pacific Building Conversion project. The floor plans and architectural designs will preserve existing office space, educational/training space, storage areas, and laundry facilities. The mechanical, electrical, plumbing and fire prevention systems within the facility will be upgraded to support the operations of a residential shelter facility. The interior upgrades include but are not limited to: a hot water plant, electrical panel upgrades, roof replacement, installation of a digital fire alarm and sprinkler system, remodeled restrooms and showers to include ADA accessible amenities, flooring repairs and replacement, and lighting upgrades. The deferred maintenance issues and all building code upgrades (per IBC code, L&I, and Kitsap County building and fire codes) will be addressed in the construction documents.

The proposed floor plans are designed to accommodate the multi-faceted operational requirements of the service providers and the needs of the guests. The Group Living shelter facility will be designed for 75 shelter beds.

Utilities & Services

Existing utilities on the property include electric (PSE), water & sewer (WSUD), and natural gas (Cascade Natural Gas). An existing storm detention pond (Kitsap County Public Works) is located on the project site. Additional services linked to the property include but are not limited to: Internet/wifi (Astound), digital cable/data service (Kitsap County IT/IS), a sewage pump station with pump monitoring system (WSUD), and a fire/smoke alarm monitoring system (Secure Pacific). Temporary fencing (National Fence), tree maintenance (NW Tree Service) and a towing service (SK Towing) are under contract. Scheduled collection of solid waste/trash/yard waste/recycled materials will be arranged when Waste Management services are required.

Property & Building History

The existing 20,040 sf building was built on the property in 1987 for recreational use. The facility offered access to fitness members and guests 24 hours/7 days per week. The building occupancy allowed a maximum of 400 people and the striped parking areas accommodated 75 vehicles with

2 handicapped accessible parking areas. Overflow parking was located on areas south of the existing asphalt parking areas.

The building was expanded in the 1990s to add a full size basketball court, two large locker rooms with toilets, sinks, lockers, and shower facilities and a laundry facility. It was remodeled (2000's) to provide a larger area for fitness classes, and add offices for onsite personal trainer and massage/physical therapy center.

Existing Building Construction:

- Original construction plans (1987/Not immediately available)
- Construction Code: 1985 UBC, UFC
- Construction Type: Type V - nonrated (Assumed)
- Size: 20,040 (Assessor office records)
- Current Use: Assembly Group A-3 (Recreational/exercise facility)
- Occupant Load: 400
- HVAC ☐ heat pump, forced air ☐ Unknown thermal blanket and insulation
- Foundation: Slab on grade
- Roof: Flat

Existing Building Fire Protection:

- Access available
- 1 - Two-hour fire wall separating building into approx. equal parts
- Zoned, analog fire alarm with smoke detectors, pull stations and audio annunciation throughout
- No automatic fire sprinklers
- No key box

Project Design Consultants ACUP documents

Kitsap County Department of Human Services has engaged Rice Fergus Miller (RFM) for architectural and engineering design services. RFM will provide design strategies, project management, code reviews, feasibility studies, and will engage consultants for research and technical reports that may include but not be limited to:

Architectural Site Plans	Storm Water Report
Building Floor Plans	Water Availability
Building Elevations	Sewer Availability
Landscape Plan	Traffic Impact Analysis
SEPA Checklist	Concurrency Test
Parking Analysis Worksheet	

The Project: Kitsap County Homeless Crisis Response and Housing Plan

The first Kitsap County Homeless Crisis Response and Housing Plan (Plan) was approved in 2005. The Plan is updated every 3-5 years. Since the Plan was adopted in 2005, Kitsap County staff have developed and implemented new strategies for responding to the evolving homeless crisis. The new strategies are based on the latest data about the population of unhoused persons, homeless households, a changing landscape of service providers, and new evidence based practices that have been successfully implemented around the country.

The most recent update to the Plan, approved by the Kitsap County Board of County Commissioners (Board) in November 2019, reports a dramatic increase in the numbers of men, women and children in Kitsap County experiencing homelessness. The past decade has been challenging for Kitsap County residents as the value of their wages has diminished, the number of households living in poverty has risen, and the lack of affordable housing has resulted in housing instability and increased homelessness. The statistics on homelessness are based on local, regional, and statewide research that collects reliable information on homeless persons that participate in "Point in Time" events and those that utilize resources in homeless shelters, local food banks, public health clinics, and a wide range of human service providers.

One action step within Plan is to increase the number of residential shelter beds available throughout Kitsap County, including South Kitsap. The overall goal is to have shelter beds available throughout the county. Research shows that unhoused people prefer to stay connected with family, friends and known resources in their community so they are more likely to seek shelter within an area close to where they last had permanent housing. They seek shelter with family/friends, in vehicles (cars, RVs), boats, or in unsupported environments such as vacant properties, parks, abandoned buildings, or encampments in the community.

The property and the Pacific Building were selected for the following reasons that include but are not limited to: 1) The geographic location in unincorporated South Kitsap County; 2) The commercial zoning designation; 3) The expansive square footage of the existing structure; 4) Abundant parking for residents, staff, and service providers; 5) Access to Kitsap Transit public transportation; 6) Access (within walking distance) to schools, banks, recreational areas, public laundry facilities, health services, veterinarians; 7) Proximity to the South Kitsap food bank and a wide range of food options such as restaurants, farmers markets, and shopping centers, and; 8) Access to a wide range of employment opportunities.

Preliminary Property Investigation:

Environment Phase I Site Assessment

Eco Compliance conducted a Phase I Environmental Site Assessment prior to the purchase of the property. The report was published on February 1, 2021 and stated *"there was no obvious onsite contamination on the property or within the immediate area. Onsite vegetation appeared healthy and there was no evidence of stress related to encroaching or onsite environmental contamination"*. The Assessment did not reveal any environmental concerns or issues related to the property or building.

Environment Building Materials Survey

Eco Compliance conducted an Asbestos, Lead, and Hazardous Building Materials Survey on the interior and exterior of the building. This was a routine investigation by hazmat professionals required for the safety of workers operating in and around the facility. The report was published on August 16, 2021 and determined that none of these hazardous materials was present in the tests conducted from samples collected in the building.

SEPA & NEPA

The WA State environmental review process follows the State Environmental Policy Act (SEPA) checklist required in the ACUP process. Additional environmental assessments to ensure the

protection of ecological systems and natural resources will be provided in a National Environmental Policy Act (NEPA), which is required for some of the grant funding for the project.

Property Survey Topography/Utilities

NL Olson & Associates performed a property survey on October 27, 2021. The survey included topographical and utility information. That survey was published on November 29, 2021.

Septic/Sewer Report

The Kitsap Public Health District (KPHD) permitted the original septic system in 1987. The septic system was abandoned and officially decommissioned in 1993. The property was connected to the public sewer system with an on site dual pump lift station. The existing sewer system and pump station are fully operational and maintained by West Sound Utility District.

B. Scope of Work

Interior scope includes: Reconfiguration of walls and doors; new MEP systems and associated slab infill to support new shower/toilet facilities, commercial warming kitchen, pet care/kennel rooms, and more; interior finish upgrades throughout, no increase in floor area.

Exterior scope includes: New doors, canopies, exterior lighting, siding replacement, re-roofing, and paint; on-ground and rooftop mechanical equipment; repairs to existing siding systems and fenestrations to remain; infill of wall openings and penetrations.

Site development includes: Frontage improvements, new generator, crease interceptor, remote FCD and precast vault, sewer pump, hardscape, landscape, site lighting, CMU walls, dumpster enclosure, fencing repair/replacement, building and monument sign replacement, parking lot reconfiguration and restriping.

C. Following documents are attached at the end of DIV 000:

1. WATER/SEWER AVAILABILITY
2. FIRE FLOW REPORT
3. TRAFFIC IMPACT ANALYSIS
4. NON-WETLAND DETERMINATION
5. HAZARDOUS MATERIAL REPORT

1.2 BIDDING REQUIREMENTS

- A. Review this material prior to submitting Bid.
- B. Available documents are for Contractor information use but are not Contract Documents and do not override provisions of Contract Documents. Portions of these documents may not be applicable to provisions of Contract Documents.

PART 2 PRODUCTS – NOT USED
PART 3 EXECUTION – NOT USED

END OF SECTION 000 31 00

SECTION 000 41 13 – BID FORM

RECEIPT OF BIDS: December 6, 2023 at 2:00 PM

TO: Kitsap County Department of Human Services (“Owner”) **FOR:** Pacific Building Conversion
Commissioners Chambers, 4th Floor Kitsap County
Administration Building
619 Division Street
Port Orchard, Washington 98366

In response to your Advertisement for Bids for the above referenced Project, the undersigned (“Bidder”) offers to furnish all of the following, required to perform the work in accordance with the contract and any addenda thereto, for the firm and fixed price set forth below: labor, materials, tools, supplies, equipment, storage, transportation, supervision, services, goods, and other items.

Please submit Part 1 (pages 1-9) in one envelope, submit Part 2 (page 10) in another envelope, and submit Part 3 (pages 11-13) in a separate envelope with bidder’s name and PART clearly labeled.

Bidder certifies that:

1. It has examined and is fully familiar with all provisions of the contract including any addenda thereto; it has carefully checked all of the words and figures which comprise this Bid; and it has by careful examination of the contract, any addenda thereto, the site and all other pertinent conditions and matters, satisfied itself as to the nature, location, character, quality, and quantity of the work required by the contract and as the conditions and other matter that may be encountered at the site or that may affect performance of the work or the cost or difficulty thereof.
2. Under penalty of perjury under the laws of the State of Washington that within the three-year period immediately preceding the date of the bid solicitation, the bidder has not been determined by a final and binding citation and notice of assessment issued by the Department of Labor and Industries or through a civil judgement entered by a court of limited or general jurisdiction to have willfully violated, as defined in RCW 49.48.082, any provision of state wage laws, chapter 49.46, 49.48, or 49.52 RCW.

Bidder’s Washington State Contractor’s Registration No.: _____

NOTE: Failure to have a license at the time of the bid opening shall result in rejection of the bid.

License Expiration Date: _____

Federal Tax Identification Number (TIN): _____

Legal Name of Bidder: _____

Business Address: _____

Contact Name: _____

Phone: _____ Email Address: _____

In submitting the Bid, the undersigned agrees:

1. To hold its bid open for sixty (60) consecutive calendar days from the date designated for receipt of bids;
2. Upon receipt of written notification from the Owner that it is the low responsive, responsible bidder, to duly execute the Agreement between Owner and Contractor, and deliver it to KITSAP COUNTY DEPARTMENT OF HUMAN SERVICES, together with all required surety bonds and certificates of insurance within seven (7) days from the date of such award;
3. To perform the work in accordance with the contract which consists of the Agreement Between Owner and Contractor, general, supplemental and any other conditions of the contract for construction, specifications, drawings, and all other Contract Documents as set for in Section 00 52 13 of the Project Manual, and all addenda thereto; and
4. To commence work under the contract upon receipt of a written Notice to Proceed and complete by the date specified in the Contract.

As full compensation for satisfactory performance of all obligations under the contract, the undersigned will perform such work for the cost defined on ATTACHMENT 1. ATTACHMENT 2 through 9 are hereto incorporated by this reference. Failure to complete and submit this form and all attachments or the inclusion of false information shall be considered evidence that this proposal is unresponsive to the terms and conditions of the bid.

Bidder acknowledges that it has satisfied itself as to the character, quality and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by Owner, as well as from the drawings and specifications made a part of these Contract Documents.

Bidder acknowledges that (1) the Owner will continue to occupy parts of the site and (2) the Owner may employ, under separate contracts, other contractors at or near the site concurrently with the work of this contract, (3) Bidder will have limited use of the premises for work, storage, access, parking, and equipment and (4) Bidder will be required to coordinate the use of the premises under the direction of the Owner.

Bidder acknowledges that adjoining areas may be conducting normal operations during the Work. Bidder should anticipate pedestrian and traffic congestion, limited parking, and the requirement that the work be coordinated with ongoing operations. Bidder acknowledges that its bid is based upon a schedule and assumptions that incorporate these conditions, and upon a schedule that complies with schedule requirements set forth in the Contract Documents.

This bid constitutes a firm offer which cannot be withdrawn until a formal contract for the work is signed by KITSAP COUNTY DEPARTMENT OF HUMAN SERVICES and another bidder or the expiration of sixty (60) calendar days after the due date for submission of bids.

ADDENDA ACKNOWLEDGEMENT

Bidder acknowledges receipt, understanding and full consideration of Addenda No.(s) by listing each addendum separately by number in the space provided below:

BIDDER RESPONSIBILITY STATEMENT

In accordance with RCW 39.04.350(1), before award of a public works contract, a Bidder must meet the following responsibility criteria to be considered a responsive bidder and qualified to be awarded a public works project. The bidder must:

- At the time of bid submittal, have a certificate of registration in compliance with chapter 18.27 RCW
- Have a current unified business identifier (UBI) number
- Have industrial insurance coverage for the Bidder's employees working in Washington as required by Title 51 RCW
- Have an employment security department number as required in Title 50 RCW
- Have a state excise tax registration number as required in Title 82 RCW
- Not be disqualified from bidding on any public works contract under RCW 39-.06.010 or 39-12-065(3).
- Bidder has received training on prevailing wage and public works requirements OR bidder is exempt from this requirement because they have completed 3 or more public works projects and have had a valid Washington business license for 3 or more years

In accordance with RCW 39.06, a public works contractor must verify responsibility criteria for each first tier subcontractor, and a subcontractor of any tier that hires other subcontractors must verify responsibility criteria for each of its subcontractors. Verification shall include that each subcontractor, at the time of the subcontract execution, meets the responsibility criteria and possesses an electric contractor license, if required by RCW 19.28 or an elevator contractor license, if required by RCW 70.87. This verification requirement, as well as the responsibility criteria, must be included in every public works contract and subcontract of every tier.

CERTIFICATION OF COMPLIANCE WITH WAGE PAYMENT STATUTES

The bidder hereby certifies that, within the three-year period immediately preceding the bid solicitation date the bidder is not a "willful" violator, as defined in RCW 49.48.082, of any provision of chapters 49.46, 49.48, or 49.52 RCW, as determined by a final and binding citation and notice of assessment

issued by the Department of Labor and Industries or through a civil judgment entered by a court of limited or general jurisdiction.

I certify under penalty of perjury under the laws of the State of Washington that the foregoing is true and correct.

Bidder's Business Name: _____

Signature of Authorized Official*: _____

Printed Name: _____

Title: _____

Date: _____ City: _____ State: _____

** If a corporation, proposal must be executed in the corporate name by the president or vice-president (or any other corporate officer accompanied by evidence of authority to sign). If a co-partnership, proposal must be executed by a partner.*

Check One: Sole Proprietorship Partnership Joint Venture Corporation

State of Incorporation, or if not a corporation, State where business entity was formed: _____

If a co-partnership, give firm name under which business is transacted: _____

If an individual using a trade name, state name of individual: _____

ATTACHMENTS

Part 1

1. Bid Price Form
2. Contractor's Bid Bond (or reasonable equivalent acceptable to the Owner)
3. Insurance Binder
4. Bidder Responsibility Checklist
5. Non-Collusion Affidavit

Part 2

6. Subcontractor Working List

Part 3

7. Subcontractor Working List for Structural Steel and Rebar Installation
8. Subcontractor Responsibility Checklist
9. Project References

**BID PRICE FORM
PART 1**

DATE OF BID OPENING: December 6, 2023 at 2:00 PM

TO: Kitsap County Department of Human Services (“Owner”) **FOR:** Pacific Building Conversion
Commissioners Chambers, 4th Floor Kitsap County
Administration Building
619 Division Street
Port Orchard, Washington 98366

Bidder’s Name: _____

SALES TAX

For all bid prices listed in this Bid Form, **DO NOT INCLUDE** applicable local and Washington State Sales Tax that will be applied to the Contract Sum.

TOTAL BASE BID AMOUNT

All work shown on plans and described in the specifications for the Pacific Building Conversion project with Kitsap County Department of Human Services.

_____ Dollars
(amount in words)

\$ _____
(amount in numbers)

TRENCH EXCAVATION SAFETY PROVISIONS

Included in the above Base Bid amount is an amount for Trench Excavation safety for any trenching exceeding a depth of four (4) feet. In accordance with Chapter 39.04 RCW, all costs for adequate trench safety systems shall be identified as a separate item. If trench excavation safety provisions do not pertain to this project, put N.A. for dollar amount. Failure to complete this requirement may render the Bid as non-responsive to the bid solicitation. The Bidder certifies that the fowling amount is included in the Base Bid for Trench Excavation Safety Provisions:

_____ Dollars
(amount in words)

\$ _____
(amount in numbers)

Signature of Authorized Official: _____

END OF ATTACHMENT 1

**CONTRACTOR’S BID BOND
PART 1**

KNOWN ALL PERSONS BY THESE PRESENTS: That we, _____

(herein “Principal”)

as Principal and _____

as Surety, are held firmly bound unto Kitsap County Department of Human Services, Kitsap County,
Washington, in the full

sum of _____ Dollars,

(\$ _____) lawful money of the United States of America for the payment
of which sum of money, well and truly to be made, the said Principal and Surety bind themselves, their and
each of their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these
presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas, the above named Principal has submitted a
bid for the Pacific Building Conversion in accordance with instructions in notice to contractors, prepared by
Kitsap County Department of Human Services and are desirous of accompanying said bid with a proposal
bond in the penalty of five (5) percent of said bid in lieu of certified check.

NOW THEREFORE, if the said Principal, upon receipt of written notice of the acceptance of such bid, shall
within seven (7) days enter into a written contract with Kitsap County Department of Human Services upon
the form of contract of said Kitsap County Department of Human Services for the completion of such
contract in accordance with the terms and conditions of said bid, and provide payment and performance
bond(s) with good and sufficient sureties for the faithful and proper fulfillment of such contract, and provide
all insurances as required by the contract, then this obligation shall be null and void; otherwise to remain in
full force and effect.

Signed, sealed and delivered in the presence of: _____
Principal

By _____

Signed, sealed and delivered in the presence of: _____
Surety

By _____

END OF ATTACHMENT 2

**INSURANCE BINDER
PART 1**

The undersigned confirms that they have reviewed the insurance and bonding requirements stated in the Contract Agreement:

Pacific Building Conversion Project

with their Insurance Provider and, if awarded the contract, will provide the required insurance at no additional cost to the Owner.

Bidder's Business Name: _____

Address: _____

Signature of Authorized Official*: _____

Printed Name: _____

Title: _____

Date: _____

END OF ATTACHMENT 3

**BIDDER RESPONSIBILITY CHECKLIST
 PART 1**

The following checklist will be used to document that the Bidder meets the bidder responsibility criteria.
Please print a copy of documentation from the appropriate website to be included with the submittal.

General Information	
Project Name: Pacific Building Conversion	Formal Bid Contract Number:
Bidder's Business Name:	Bid Submittal Deadline:
Contractor Registration	
License Number:	Status: Active: Yes <input type="checkbox"/> No <input type="checkbox"/>
Effective Date (must be effective on or before Bid Submittal Deadline):	Expiration Date:
Contractor Infraction List	
Is Bidder on Infraction List? Yes <input type="checkbox"/> No <input type="checkbox"/>	
Current UBI Number	
UBI Number:	Account Status: Open <input type="checkbox"/> Closed <input type="checkbox"/>
Industrial Insurance Coverage	
Account Number:	Account Current: Yes <input type="checkbox"/> No <input type="checkbox"/>
Employment Security Department Number	
Employment Security Department Number:	
Provide a copy of the latest correspondence containing bidder's account number with Employment Security Department. Do not provide documents containing personal information such as social security numbers.	
State Excise Tax Registration Number	
Tax Registration Number:	Account Status: Open <input type="checkbox"/> Closed <input type="checkbox"/>
Not Disqualified from Bidding	
Has the Bidder been listed on the "Contractors Not Allowed to Bid" list of the Department of Labor and Industries in the last two (2) years? Yes <input type="checkbox"/> No <input type="checkbox"/>	
Bankruptcy	
Has the Bidder declared Bankruptcy in the last five (5) years? Yes <input type="checkbox"/> No <input type="checkbox"/>	
Information Supplied by:	
Print Name of Bidder Representative:	Date:

END OF ATTACHMENT 4

**NON-COLLUSION AFFIDAVIT
PART 1**

The undersigned, being duly sworn, deposes and says that the person, firm, association, co-partnership or corporation herein named, has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in the preparation and submission of this proposal to Kitsap County for its consideration in the award of the contract.

Legal Name of Bidder

Sole Partnership _____
Partnership _____
Corporation _____
Other _____

By (Signature)

Street Address

City State Zip

Date

State of Washington Contractor's Number

STATE OF WASHINGTON)
) SS.
(COUNTY OF KITSAP)

On this day personally appeared before me _____ to me known to be the individual described in and who executed the within and foregoing instrument, and acknowledged that _____ signed the same as _____ free and voluntary act and deed, for the uses and purposes therein mentioned.

GIVEN under my hand and official seal this _____ day of _____, 2023

Notary Public in and for the State of Washington, residing at

My Commission Expires: _____

END OF ATTACHMENT 5

**SUBCONTRACTOR WORKING LIST
PART 2**

PART 2 DUE BY: December 6, 2023 at 3:00 PM

TO: Kitsap County Department of Human Services (“Owner”) **FOR:** Pacific Building Conversion
Commissioners Chambers, 4th Floor Kitsap County
Administration Building
619 Division Street
Port Orchard, Washington 98366

Bidder’s Name: _____

SUBCONTRACTOR WORK LISTING

Supply the names of the subcontractor performing Heating, Ventilation, Air Conditioning (HVAC), Plumbing, and Electrical work. If a Subcontractor intends to use a lower tier Subcontractor to perform one of these scopes of work, the Bidder need not identify the sub-tier subcontractor, but rather the Bidder must identify the first tier Subcontractor whose scope of work includes Heating, Ventilation, Air Conditioning, Plumbing, and Electrical. The list of HVAC, Plumbing, and Electrical subcontractors must be submitted within one hour of the published bid submittal time.

Work Category	Responsible Subcontractor
HVAC	
Plumbing	
Electrical	

(Fill in each box. If work is performed by Bidder, please list your company’s name under subcontractor. If there is no such work on this Project, put “N/A” under subcontractor. Do not leave it blank.)

Signature of Authorized Official: _____

END OF ATTACHMENT 6

**SUBCONTRACTOR WORKING LIST FOR STRUCTURAL STEEL AND REBAR INSTALLATION
PART 3**

PART 3 DUE BY: December 8, 2023 at 2:00 PM

TO: Kitsap County Department of Human Services (“Owner”) **FOR:** Pacific Building Conversion
Commissioners Chambers, 4th Floor Kitsap County
Administration Building
619 Division Street
Port Orchard, Washington 98366

Bidder’s Name: _____

SUBCONTRACTOR WORK LISTING

Subcontractor performing Structural Steel Installation and Rebar Installation work. If a Subcontractor intends to use a lower tier Subcontractor to perform one of these scopes of work, the Bidder need not identify the sub-tier subcontractor, but rather the Bidder must identify the first tier Subcontractor whose scope of work includes Structural Steel Installation and/or Rebar Installation. The list of Structural Steel Installation and Rebar Installation subcontractors must be submitted within forty-eight hours of the published bid submittal time.

Work Category	Responsible Subcontractor
Structural Steel Installation	
Rebar Installation	

(Fill in each box. If work is performed by Bidder, please list your company’s name under subcontractor. If there is no such work on this Project, put “N/A” under subcontractor. Do not leave it blank.)

Signature of Authorized Official: _____

END OF ATTACHMENT 7

**SUBCONTRACTOR RESPONSIBILITY CHECKLIST
 PART 3**

The following checklist will be used to document that the Bidder meets the bidder responsibility criteria.
Please print a copy of documentation from the appropriate website to be included with the submittal.

General Information	
Project Name: Pacific Building Conversion	Formal Bid Contract Number:
Subcontractor's Business Name:	Subcontract Execution Date:
Contractor Registration	
License Number:	Status: Active: Yes <input type="checkbox"/> No <input type="checkbox"/>
Effective Date (must be effective on or before Subcontract Bid Submittal Deadline):	Expiration Date:
Contractor Infraction List	
Is Subcontractor on Infraction List? Yes <input type="checkbox"/> No <input type="checkbox"/>	
Current UBI Number	
UBI Number:	Account Status: Open <input type="checkbox"/> Closed <input type="checkbox"/>
Industrial Insurance Coverage	
Account Number:	Account Current: Yes <input type="checkbox"/> No <input type="checkbox"/>
Employment Security Department Number	
Employment Security Department Number:	
Provide a copy of the latest correspondence containing bidder's account number with Employment Security Department. Do not provide documents containing personal information such as social security numbers.	
State Excise Tax Registration Number	
Tax Registration Number:	Account Status: Open <input type="checkbox"/> Closed <input type="checkbox"/>
Not Disqualified from Bidding	
Has the Subcontractor been listed on the "Contractors Not Allowed to Bid" list of the Department of Labor and Industries? Yes <input type="checkbox"/> No <input type="checkbox"/>	
Is the Subcontractor listed as debarred or suspended in the federal System for Award Management (SAM.Gov)? Yes <input type="checkbox"/> No <input type="checkbox"/>	
Contractor Licenses	
Electrical: If required by Chapter 19.28 RCW, does the Subcontractor have an Electrical Contractor's License? Yes <input type="checkbox"/> No <input type="checkbox"/>	
Elevator: If required by Chapter 70.87 RCW, does the Subcontractor have an Elevator Contractor's License? Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
Information Supplied by:	
Print Name of Employee:	Date:

END OF ATTACHMENT 8

PROJECT REFERENCES
PART 3

Using the following form (use additional forms as needed), the Bidder shall describe projects that meet the similar size and scope of the Pacific Building Conversion project.

Project Name: _____

Project Manager: _____

Project Superintendent: _____

Public Agency Name: _____

Contact Person: _____

Phone No: _____

Awarded Contract Amount: _____

Final Contract Amount: _____

Project Start Date: _____

Project Completion Date: _____

Project Location: _____

Project Scope:

Claims if any filed by the Contractor. Explain the basis for each claim:

Additional Information/Comments:

END OF ATTACHMENT 9

SECTION 000 52 13 – AGREEMENT FORM

PART 1 GENERAL

1.1 FORM OF CONTRACT

- A. The Capital Projects Contract Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, as modified by the Owner, is bound herein for Kitap County Department of Human Services, Port Orchard, Washington. The Contractor and all subcontractors shall read and be governed by them.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION 000 52 13

DRAFT AIA® Document A101® - 2017

Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum

AGREEMENT made as of the day of in the year
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

and the Contractor:
(Name, legal status, address and other information)

for the following Project:
(Name, location and detailed description)

The Architect:
(Name, legal status, address and other information)

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

The parties should complete A101®-2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201®-2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.



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TABLE OF ARTICLES

- 1 THE CONTRACT DOCUMENTS
- 2 THE WORK OF THIS CONTRACT
- 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION
- 4 CONTRACT SUM
- 5 PAYMENTS
- 6 DISPUTE RESOLUTION
- 7 TERMINATION OR SUSPENSION
- 8 MISCELLANEOUS PROVISIONS
- 9 ENUMERATION OF CONTRACT DOCUMENTS

EXHIBIT A INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:

(Check one of the following boxes.)

- The date of this Agreement.
- A date set forth in a notice to proceed issued by the Owner.
- Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)
-

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:

(Check one of the following boxes and complete the necessary information.)

[« »] Not later than « » (« ») calendar days from the date of commencement of the Work.

[« »] By the following date: « »

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be « » (\$ « »), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement. (Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item	Price	Conditions for Acceptance

§ 4.3 Allowances, if any, included in the Contract Sum: (Identify each allowance.)

Item	Price

§ 4.4 Unit prices, if any:

(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit (\$0.00)

§ 4.5 Liquidated damages, if any:

(Insert terms and conditions for liquidated damages, if any.)

« »

§ 4.6 Other:

(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)

« »

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

« »

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the « » day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the « » day of the « » month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than « » (« ») days after the Architect receives the Application for Payment.

(Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 In accordance with AIA Document A201™–2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

- .1 That portion of the Contract Sum properly allocable to completed Work;
- .2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
- .3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

- .1 The aggregate of any amounts previously paid by the Owner;
- .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017;
- .3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- .4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017; and
- .5 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:

(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

« »

§ 5.1.7.1.1 The following items are not subject to retainage:
(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

<< >>

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:
(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

<< >>

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:
(Insert any other conditions for release of retainage upon Substantial Completion.)

<< >>

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2017.

§ 5.1.9 Except with the Owner’s prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

- .1 the Contractor has fully performed the Contract except for the Contractor’s responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment; and
- .2 a final Certificate for Payment has been issued by the Architect.

§ 5.2.2 The Owner’s final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect’s final Certificate for Payment, or as follows:

<< >>

§ 5.3 Interest

Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

(Insert rate of interest agreed upon, if any.)

<< >> % << >>

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker.
(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

<< >>

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<< >>

§ 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:

(Check the appropriate box.)

Arbitration pursuant to Section 15.4 of AIA Document A201–2017

Litigation in a court of competent jurisdiction

Other (Specify)

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017.

§ 7.1.1 If the Contract is terminated for the Owner’s convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows:

(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner’s convenience.)

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner’s representative:

(Name, address, email address, and other information)

§ 8.3 The Contractor’s representative:

(Name, address, email address, and other information)

§ 8.4 Neither the Owner’s nor the Contractor’s representative shall be changed without ten days’ prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A101™-2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A101™-2017 Exhibit A, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A201-2017, may be given in accordance with AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:

(If other than in accordance with AIA Document E203-2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)

« »

§ 8.7 Other provisions:

« »

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

- .1 AIA Document A101™-2017, Standard Form of Agreement Between Owner and Contractor
- .2 AIA Document A101™-2017, Exhibit A, Insurance and Bonds
- .3 AIA Document A201™-2017, General Conditions of the Contract for Construction
- .4 AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:

(Insert the date of the E203-2013 incorporated into this Agreement.)

« »

.5 Drawings

Number	Title	Date

.6 Specifications

Section	Title	Date	Pages

.7 Addenda, if any:

Number	Date	Pages

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

.8 Other Exhibits:

(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

[« »] AIA Document E204™-2017, Sustainable Projects Exhibit, dated as indicated below:
(Insert the date of the E204-2017 incorporated into this Agreement.)

<< >>

[<< >>] The Sustainability Plan:

Title	Date	Pages

[<< >>] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages

9 Other documents, if any, listed below:

(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™-2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

<< >>

This Agreement entered into as of the day and year first written above.

OWNER (Signature)

<< >><< >>

(Printed name and title)

CONTRACTOR (Signature)

<< >><< >>

(Printed name and title)

DRAFT AIA® Document A101® - 2017

Exhibit A

Insurance and Bonds

This Insurance and Bonds Exhibit is part of the Agreement, between the Owner and the Contractor, dated the « » day of « » in the year « »
(In words, indicate day, month and year.)

for the following PROJECT:
(Name and location or address)

« »
« »

THE OWNER:
(Name, legal status and address)

« »
« »

THE CONTRACTOR:
(Name, legal status and address)

« »
« »

TABLE OF ARTICLES

- A.1 GENERAL
- A.2 OWNER'S INSURANCE
- A.3 CONTRACTOR'S INSURANCE AND BONDS
- A.4 SPECIAL TERMS AND CONDITIONS

ARTICLE A.1 GENERAL

The Owner and Contractor shall purchase and maintain insurance, and provide bonds, as set forth in this Exhibit. As used in this Exhibit, the term General Conditions refers to AIA Document A201™-2017, General Conditions of the Contract for Construction.

ARTICLE A.2 OWNER'S INSURANCE

§ A.2.1 General

Prior to commencement of the Work, the Owner shall secure the insurance, and provide evidence of the coverage, required under this Article A.2 and, upon the Contractor's request, provide a copy of the property insurance policy or policies required by Section A.2.3. The copy of the policy or policies provided shall contain all applicable conditions, definitions, exclusions, and endorsements.

§ A.2.2 Liability Insurance

The Owner shall be responsible for purchasing and maintaining the Owner's usual general liability insurance.

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This document is intended to be used in conjunction with AIA Document A201®-2017, General Conditions of the Contract for Construction. Article 11 of A201®-2017 contains additional insurance provisions.

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§ A.2.3 Required Property Insurance

§ A.2.3.1 Unless this obligation is placed on the Contractor pursuant to Section A.3.3.2.1, the Owner shall purchase and maintain, from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located, property insurance written on a builder's risk "all-risks" completed value or equivalent policy form and sufficient to cover the total value of the entire Project on a replacement cost basis. The Owner's property insurance coverage shall be no less than the amount of the initial Contract Sum, plus the value of subsequent Modifications and labor performed and materials or equipment supplied by others. The property insurance shall be maintained until Substantial Completion and thereafter as provided in Section A.2.3.1.3, unless otherwise provided in the Contract Documents or otherwise agreed in writing by the parties to this Agreement. This insurance shall include the interests of the Owner, Contractor, Subcontractors, and Sub-subcontractors in the Project as insureds. This insurance shall include the interests of mortgagees as loss payees.

§ A.2.3.1.1 **Causes of Loss.** The insurance required by this Section A.2.3.1 shall provide coverage for direct physical loss or damage, and shall not exclude the risks of fire, explosion, theft, vandalism, malicious mischief, collapse, earthquake, flood, or windstorm. The insurance shall also provide coverage for ensuing loss or resulting damage from error, omission, or deficiency in construction methods, design, specifications, workmanship, or materials. Sub-limits, if any, are as follows:

(Indicate below the cause of loss and any applicable sub-limit.)

Causes of Loss	Sub-Limit

§ A.2.3.1.2 **Specific Required Coverages.** The insurance required by this Section A.2.3.1 shall provide coverage for loss or damage to falsework and other temporary structures, and to building systems from testing and startup. The insurance shall also cover debris removal, including demolition occasioned by enforcement of any applicable legal requirements, and reasonable compensation for the Architect's and Contractor's services and expenses required as a result of such insured loss, including claim preparation expenses. Sub-limits, if any, are as follows:

(Indicate below type of coverage and any applicable sub-limit for specific required coverages.)

Coverage	Sub-Limit

§ A.2.3.1.3 Unless the parties agree otherwise, upon Substantial Completion, the Owner shall continue the insurance required by Section A.2.3.1 or, if necessary, replace the insurance policy required under Section A.2.3.1 with property insurance written for the total value of the Project that shall remain in effect until expiration of the period for correction of the Work set forth in Section 12.2.2 of the General Conditions.

§ A.2.3.1.4 **Deductibles and Self-Insured Retentions.** If the insurance required by this Section A.2.3 is subject to deductibles or self-insured retentions, the Owner shall be responsible for all loss not covered because of such deductibles or retentions.

§ A.2.3.2 **Occupancy or Use Prior to Substantial Completion.** The Owner's occupancy or use of any completed or partially completed portion of the Work prior to Substantial Completion shall not commence until the insurance company or companies providing the insurance under Section A.2.3.1 have consented in writing to the continuance of coverage. The Owner and the Contractor shall take no action with respect to partial occupancy or use that would cause cancellation, lapse, or reduction of insurance, unless they agree otherwise in writing.

§ A.2.3.3 Insurance for Existing Structures

If the Work involves remodeling an existing structure or constructing an addition to an existing structure, the Owner shall purchase and maintain, until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, "all-risks" property insurance, on a replacement cost basis, protecting the existing structure against direct physical loss or damage from the causes of loss identified in Section A.2.3.1, notwithstanding the undertaking of the Work. The Owner shall be responsible for all co-insurance penalties.

§ A.2.4 Optional Extended Property Insurance.

The Owner shall purchase and maintain the insurance selected and described below.

(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. For each type of insurance selected, indicate applicable limits of coverage or other conditions in the fill point below the selected item.)

- [] § A.2.4.1 Loss of Use, Business Interruption, and Delay in Completion Insurance, to reimburse the Owner for loss of use of the Owner's property, or the inability to conduct normal operations due to a covered cause of loss.
-
- [] § A.2.4.2 Ordinance or Law Insurance, for the reasonable and necessary costs to satisfy the minimum requirements of the enforcement of any law or ordinance regulating the demolition, construction, repair, replacement or use of the Project.
-
- [] § A.2.4.3 Expediting Cost Insurance, for the reasonable and necessary costs for the temporary repair of damage to insured property, and to expedite the permanent repair or replacement of the damaged property.
-
- [] § A.2.4.4 Extra Expense Insurance, to provide reimbursement of the reasonable and necessary excess costs incurred during the period of restoration or repair of the damaged property that are over and above the total costs that would normally have been incurred during the same period of time had no loss or damage occurred.
-
- [] § A.2.4.5 Civil Authority Insurance, for losses or costs arising from an order of a civil authority prohibiting access to the Project, provided such order is the direct result of physical damage covered under the required property insurance.
-
- [] § A.2.4.6 Ingress/Egress Insurance, for loss due to the necessary interruption of the insured's business due to physical prevention of ingress to, or egress from, the Project as a direct result of physical damage.
-
- [] § A.2.4.7 Soft Costs Insurance, to reimburse the Owner for costs due to the delay of completion of the Work, arising out of physical loss or damage covered by the required property insurance: including construction loan fees; leasing and marketing expenses; additional fees, including those of architects, engineers, consultants, attorneys and accountants, needed for the completion of the construction, repairs, or reconstruction; and carrying costs such as property taxes, building permits, additional interest on loans, realty taxes, and insurance premiums over and above normal expenses.
-

§ A.2.5 Other Optional Insurance.

The Owner shall purchase and maintain the insurance selected below.

(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance.)

[« »] § A.2.5.1 Cyber Security Insurance for loss to the Owner due to data security and privacy breach, including costs of investigating a potential or actual breach of confidential or private information. (Indicate applicable limits of coverage or other conditions in the fill point below.)

« »

[« »] § A.2.5.2 Other Insurance (List below any other insurance coverage to be provided by the Owner and any applicable limits.)

Coverage	Limits
----------	--------

ARTICLE A.3 CONTRACTOR'S INSURANCE AND BONDS

§ A.3.1 General

§ A.3.1.1 Certificates of Insurance. The Contractor shall provide certificates of insurance acceptable to the Owner evidencing compliance with the requirements in this Article A.3 at the following times: (1) prior to commencement of the Work; (2) upon renewal or replacement of each required policy of insurance; and (3) upon the Owner's written request. An additional certificate evidencing continuation of commercial liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment and thereafter upon renewal or replacement of such coverage until the expiration of the periods required by Section A.3.2.1 and Section A.3.3.1. The certificates will show the Owner as an additional insured on the Contractor's Commercial General Liability and excess or umbrella liability policy or policies.

§ A.3.1.2 Deductibles and Self-Insured Retentions. The Contractor shall disclose to the Owner any deductible or self-insured retentions applicable to any insurance required to be provided by the Contractor.

§ A.3.1.3 Additional Insured Obligations. To the fullest extent permitted by law, the Contractor shall cause the commercial general liability coverage to include (1) the Owner, the Architect, and the Architect's consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions for which loss occurs during completed operations. The additional insured coverage shall be primary and non-contributory to any of the Owner's general liability insurance policies and shall apply to both ongoing and completed operations. To the extent commercially available, the additional insured coverage shall be no less than that provided by Insurance Services Office, Inc. (ISO) forms CG 20 10 07 04, CG 20 37 07 04, and, with respect to the Architect and the Architect's consultants, CG 20 32 07 04.

§ A.3.2 Contractor's Required Insurance Coverage

§ A.3.2.1 The Contractor shall purchase and maintain the following types and limits of insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below: (If the Contractor is required to maintain insurance for a duration other than the expiration of the period for correction of Work, state the duration.)

« »

§ A.3.2.2 Commercial General Liability

§ A.3.2.2.1 Commercial General Liability insurance for the Project written on an occurrence form with policy limits of not less than « » (\$ « ») each occurrence, « » (\$ « ») general aggregate, and « » (\$ « ») aggregate for products-completed operations hazard, providing coverage for claims including

- .1 damages because of bodily injury, sickness or disease, including occupational sickness or disease, and death of any person;
- .2 personal injury and advertising injury;
- .3 damages because of physical damage to or destruction of tangible property, including the loss of use of such property;
- .4 bodily injury or property damage arising out of completed operations; and

.5 the Contractor's indemnity obligations under Section 3.18 of the General Conditions.

§ A.3.2.2.2 The Contractor's Commercial General Liability policy under this Section A.3.2.2 shall not contain an exclusion or restriction of coverage for the following:

- .1 Claims by one insured against another insured, if the exclusion or restriction is based solely on the fact that the claimant is an insured, and there would otherwise be coverage for the claim.
- .2 Claims for property damage to the Contractor's Work arising out of the products-completed operations hazard where the damaged Work or the Work out of which the damage arises was performed by a Subcontractor.
- .3 Claims for bodily injury other than to employees of the insured.
- .4 Claims for indemnity under Section 3.18 of the General Conditions arising out of injury to employees of the insured.
- .5 Claims or loss excluded under a prior work endorsement or other similar exclusionary language.
- .6 Claims or loss due to physical damage under a prior injury endorsement or similar exclusionary language.
- .7 Claims related to residential, multi-family, or other habitational projects, if the Work is to be performed on such a project.
- .8 Claims related to roofing, if the Work involves roofing.
- .9 Claims related to exterior insulation finish systems (EIFS), synthetic stucco or similar exterior coatings or surfaces, if the Work involves such coatings or surfaces.
- .10 Claims related to earth subsidence or movement, where the Work involves such hazards.
- .11 Claims related to explosion, collapse and underground hazards, where the Work involves such hazards.

§ A.3.2.3 Automobile Liability covering vehicles owned, and non-owned vehicles used, by the Contractor, with policy limits of not less than « » (\$ « ») per accident, for bodily injury, death of any person, and property damage arising out of the ownership, maintenance and use of those motor vehicles along with any other statutorily required automobile coverage.

§ A.3.2.4 The Contractor may achieve the required limits and coverage for Commercial General Liability and Automobile Liability through a combination of primary and excess or umbrella liability insurance, provided such primary and excess or umbrella insurance policies result in the same or greater coverage as the coverages required under Section A.3.2.2 and A.3.2.3, and in no event shall any excess or umbrella liability insurance provide narrower coverage than the primary policy. The excess policy shall not require the exhaustion of the underlying limits only through the actual payment by the underlying insurers.

§ A.3.2.5 Workers' Compensation at statutory limits.

§ A.3.2.6 Employers' Liability with policy limits not less than « » (\$ « ») each accident, « » (\$ « ») each employee, and « » (\$ « ») policy limit.

§ A.3.2.7 Jones Act, and the Longshore & Harbor Workers' Compensation Act, as required, if the Work involves hazards arising from work on or near navigable waterways, including vessels and docks

§ A.3.2.8 If the Contractor is required to furnish professional services as part of the Work, the Contractor shall procure Professional Liability insurance covering performance of the professional services, with policy limits of not less than « » (\$ « ») per claim and « » (\$ « ») in the aggregate.

§ A.3.2.9 If the Work involves the transport, dissemination, use, or release of pollutants, the Contractor shall procure Pollution Liability insurance, with policy limits of not less than « » (\$ « ») per claim and « » (\$ « ») in the aggregate.

§ A.3.2.10 Coverage under Sections A.3.2.8 and A.3.2.9 may be procured through a Combined Professional Liability and Pollution Liability insurance policy, with combined policy limits of not less than « » (\$ « ») per claim and « » (\$ « ») in the aggregate.

§ A.3.2.11 Insurance for maritime liability risks associated with the operation of a vessel, if the Work requires such activities, with policy limits of not less than « » (\$ « ») per claim and « » (\$ « ») in the aggregate.

§ A.3.2.12 Insurance for the use or operation of manned or unmanned aircraft, if the Work requires such activities, with policy limits of not less than « » (\$ « ») per claim and « » (\$ « ») in the aggregate.

§ A.3.3 Contractor's Other Insurance Coverage

§ A.3.3.1 Insurance selected and described in this Section A.3.3 shall be purchased from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:

(If the Contractor is required to maintain any of the types of insurance selected below for a duration other than the expiration of the period for correction of Work, state the duration.)

« »

§ A.3.3.2 The Contractor shall purchase and maintain the following types and limits of insurance in accordance with Section A.3.3.1.

(Select the types of insurance the Contractor is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. Where policy limits are provided, include the policy limit in the appropriate fill point.)

- [« »] § A.3.3.2.1 Property insurance of the same type and scope satisfying the requirements identified in Section A.2.3, which, if selected in this section A.3.3.2.1, relieves the Owner of the responsibility to purchase and maintain such insurance except insurance required by Section A.2.3.1.3 and Section A.2.3.3. The Contractor shall comply with all obligations of the Owner under Section A.2.3 except to the extent provided below. The Contractor shall disclose to the Owner the amount of any deductible, and the Owner shall be responsible for losses within the deductible. Upon request, the Contractor shall provide the Owner with a copy of the property insurance policy or policies required. The Owner shall adjust and settle the loss with the insurer and be the trustee of the proceeds of the property insurance in accordance with Article 11 of the General Conditions unless otherwise set forth below: *(Where the Contractor's obligation to provide property insurance differs from the Owner's obligations as described under Section A.2.3, indicate such differences in the space below. Additionally, if a party other than the Owner will be responsible for adjusting and settling a loss with the insurer and acting as the trustee of the proceeds of property insurance in accordance with Article 11 of the General Conditions, indicate the responsible party below.)*

« »

- [« »] § A.3.3.2.2 Railroad Protective Liability Insurance, with policy limits of not less than « » (\$ « ») per claim and « » (\$ « ») in the aggregate, for Work within fifty (50) feet of railroad property.
- [« »] § A.3.3.2.3 Asbestos Abatement Liability Insurance, with policy limits of not less than « » (\$ « ») per claim and « » (\$ « ») in the aggregate, for liability arising from the encapsulation, removal, handling, storage, transportation, and disposal of asbestos-containing materials.
- [« »] § A.3.3.2.4 Insurance for physical damage to property while it is in storage and in transit to the construction site on an "all-risks" completed value form.
- [« »] § A.3.3.2.5 Property insurance on an "all-risks" completed value form, covering property owned by the Contractor and used on the Project, including scaffolding and other equipment.
- [« »] § A.3.3.2.6 Other Insurance
(List below any other insurance coverage to be provided by the Contractor and any applicable limits.)

Coverage

Limits

§ A.3.4 Performance Bond and Payment Bond

The Contractor shall provide surety bonds, from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located, as follows:

(Specify type and penal sum of bonds.)

Type

Penal Sum (\$0.00)

Payment Bond

Performance Bond

Payment and Performance Bonds shall be AIA Document A312™, Payment Bond and Performance Bond, or contain provisions identical to AIA Document A312™, current as of the date of this Agreement.

ARTICLE A.4 SPECIAL TERMS AND CONDITIONS

Special terms and conditions that modify this Insurance and Bonds Exhibit, if any, are as follows:

<< >>

SECTION 000 61 13 – PERFORMANCE AND PAYMENT BOND

KNOWN ALL PERSONS BY THESE PRESENTS: That we, _____
_____ (herein "Principal")

as Principal and _____

a corporation organized and existing under and by virtue of the laws of the State of _____
as Surety, are held firmly bound unto Kitsap County Department of Human Services ("County") as Obligee,

in the sum of _____ Dollars,

plus Washington State sales tax at 9.20 percent (applicable sales tax amount of \$ _____)

for the total sum of _____ Dollars

(\$ _____) which we bind ourselves, our heirs, executors, administrators,
successors and assigns, jointly and severally, by these presents.

WHEREAS, the Principal entered into Contract No. _____ dated _____

for the _____ project which Contract is by reference
made part hereof and is hereafter referred to as the Contract.

This Bond is executed pursuant to Chapter 39.08 RCW provided, that the Surety and Principal agree that with respect to the notice required by RCW 39.08.030, subcontractors and suppliers of the Principal shall not be required to give the notice in order to be paid for sums which otherwise become due and owing during the course of performance of the Contract but, such subcontractors and suppliers shall be required to give the notice by the deadline provided in the statute in order to have any claim against this bond after the deadline or to file suit under RCW 39.08.065, and after the deadline in RCW 39.08.030 all claims for which notice has not been given thereunder such be barred.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the Principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of said Contract and any and all duly authorized amendments, changes, modifications, alterations, additions and extensions thereto (together, "Amendments") of said Contract and pay all laborers, mechanics, subcontractors, materialmen and all persons who shall supply said Principal or said subcontractor with provisions and supplies for the carrying on of such work during the original term of said Contract and any extension thereof that may be granted by the District, with or without notice to the Surety, and during the life of any guaranty required under the Contract and shall well and truly perform and fulfill the undertakings, covenants, terms, conditions and agreements of the Contract and any and all duly authorized modifications of said Contract and pay all laborers, mechanics, subcontractors, materialmen and all persons who supply said Principal or said subcontractors with provisions and supplies for the carrying on of such Amendments which may hereafter be made, notice of which Amendments to the Surety being hereby waived, then this obligation to be void; otherwise to remain in full force and effect.

Dated this _____ day of _____, 20_____

Approved: _____

Principal

Secretary

Approved: _____

Surety

By _____

(Attach Power of Attorney)

Contact Person: _____ Phone No.: _____

Address: _____

END OF SECTION 000 61 13

SECTION 000 62 20 – STATEMENT OF INTENT TO PAY PREVAILING WAGES

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Contractor shall create an account and file all required documents online with the Washington State Department of Labor and Industries. Refer to the following website.

<https://lni.wa.gov/licensing-permits/public-works-projects/contractors-employers/#when-the-work-is-done>

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION 000 62 20

**SECTION 000 62 30
AFFIDAVIT OF WAGES PAID**

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Contractor shall create an account and file all required documents online with the Washington State Department of Labor and Industries. Refer to the following website.

<https://lni.wa.gov/licensing-permits/public-works-projects/contractors-employers/#when-the-work-is-done>

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION 000 62 30

SECTION 000 72 00 – GENERAL CONDITIONS OF THE CONTRACT

PART 1 GENERAL

1.1 STANDARD FORM

- A. The General Conditions of the Contract for Construction, AIA Document A201-2017, as modified by the Owner, is bound herein for Kitsap County Division of Human Services, Port Orchard, Washington. The Contractor and all subcontractors shall read and be governed by them.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION 000 72 13

DRAFT AIA® Document A201® - 2017

General Conditions of the Contract for Construction

for the following PROJECT:

(Name and location or address)

<< >>
<< >>

THE OWNER:

(Name, legal status and address)

<< >>< >>
<< >>

THE ARCHITECT:

(Name, legal status and address)

<< >>< >>
<< >>

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This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or

relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as

the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- .1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- .3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and

similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will

specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in

number and means a Subcontractor or an authorized representative of the Subcontractor. The term “Subcontractor” does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term “Sub-subcontractor” is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor’s Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor’s Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

- .1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;

- .2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
- .5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- .1 defective Work not remedied;
 - .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
 - .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
 - .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
 - .5 damage to the Owner or a Separate Contractor;
 - .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;
- or

.7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- .1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents;
- .3 terms of special warranties required by the Contract Documents; or
- .4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

- .1 employees on the Work and other persons who may be affected thereby;

- 2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
- 3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed

by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 **Notice of Cancellation or Expiration of Contractor's Required Insurance.** Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the

procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 **Failure to Purchase Required Property Insurance.** If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 **Notice of Cancellation or Expiration of Owner's Required Property Insurance.** Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect

timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- .4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract

Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work

properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

§ 15.1.7 Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party

provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.



SECTION 000 73 00 – SPECIAL CONDITIONS OF THE CONTRACT

PART 1 GENERAL

1.1 STANDARD FORM

- A. Special Conditions may modify, change, delete, or add to the General Conditions. Where any article of the General Conditions is modified or any paragraph, subparagraph or clause thereof is modified or deleted by the Special Conditions, the unaltered provisions of such article, paragraph, subparagraph or clause shall remain in effect. The General Conditions and Special Conditions are applicable to all of the Work under this Contract and shall apply to the Contractor and all Subcontractors, of any tier. The Special Conditions to the Contract is bound herein for Kitap County Department of Human Services, Port Orchard, Washington. The Contractor and all subcontractors shall read and be governed by them.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION 000 73 00

ATTACHMENTS

1. Housing and Urban Development ACT of 1968, 12 U.S.C. 1701 U
2. HUD-50071 Certification of Payments to Influence Federal Transactions
3. Certification Regarding Debarment and Suspension

SPECIAL CONDITIONS OF THE CONTRACT

A. HOUSING AND URBAN DEVELOPMENT ACT OF 1968, 12 U.S.C. 1701 U

Section 3 Requirements

- A. The parties to this contract agree to comply with HUD's regulations in 24 CFR Part 75, which implement section 3. As evidenced by their execution of this contract, the parties to this contract certify that they are under no contractual or other impediment that would prevent them from complying with the Part 75 regulations.
- B. The contractor agrees to include this section 3 clause in every subcontract subject to compliance with regulations in 24 CFR Part 75, and agrees to take appropriate action, as provided in an applicable provision of the subcontract or in this section 3 clause, upon a finding that the subcontractor is in violation of the regulations in 24 CFR Part 75. The contractor will not subcontract with any subcontractor where the contractor has notice or knowledge that the subcontractor has been found in violation of the regulations in 24 CFR Part 75.
- C. Noncompliance with HUD's regulations in 24 CFR Part 75 may result in sanctions, termination of this contract for default, and debarment or suspension from future HUD assisted contracts.

B. CLEAN AIR ACT (42 U.S.C. 7401 ES SEQ.) AND THE FEDERAL WATER POLLUTION CONTROL ACT (33 U.S.C. 1251 ET SEQ.) AS AMENDED

The contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act and Federal Water Pollution Control Act.

C. PROHIBITION ON THE USE OF FUNDS FOR LOBBYING ACTIVITIES

The Byrd Anti-Lobbying Amendment, 31 U.S.C. 1352, prohibits recipients of federal contracts, awards, cooperative agreements, and loans from using appropriated funds to influence the Executive or Legislative Branches of the federal government in connection with a specific contract, award, cooperative agreement, loan, or any other award covered by §1352. 18 U.S.C. - The contractor agrees to certify that no Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, or the entering into of any cooperative agreement. Certification attached.

D. EQUAL EMPLOYMENT OPPORTUNITY

Except as otherwise provided under 41 CFR Part 60, all contracts that meet the definition of "federally assisted construction contract" in 41 CFR Part 60-1.3 must include the equal opportunity clause provided under 41 CFR 60-1.4(b), in accordance with Executive Order 11246, "Equal Employment Opportunity". The following equal opportunity clause must be included in all contracts and subcontracts:

- (1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex or national origin. Such action shall include, but not be limited to the following:
 - a. employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting officer setting forth the provisions of this nondiscrimination clause.
- (2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
- (3) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.
- (4) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice, to be provided advising the said labor union worker's representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- (5) The contractor will comply with all provisions of Executive Order No. 11246 of Sept. 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- (6) The contractor will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- (7) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of such rules, regulations, or orders, this contract may be cancelled, terminated or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order No. 11246 of Sept. 24, 1965, and such other sanctions

may be imposed and remedies invoked as provided in Executive Order No. 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

- (8) The contractor will include the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as may be directed by the Secretary of Labor as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, that in the event the contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction, the contractor may request the United States to enter into such litigation to protect the interests of the United States."

E. DEBARMENT AND SUSPENSION (E.O.s 12549 and 12689)

No contract shall be made to parties listed on the government wide exclusions in the System for Award Management (SAM). SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded. - The contractor agrees to certify that it is not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded by any Federal department or agency in accordance with Executive Orders 12549 and 12689, 24 C.F.R. Pt. 24. Certification attached.

F. PERMITS, FEES AND NOTICES

The Owner shall secure and pay for all required plan-checking fees, the building permit fee, and the L & I electrical permit fee. The Contractor shall secure and pay for (as a part of the Contract Sum and not as an allowance) all other permits and governmental fees, licenses and inspections necessary for proper execution and completion of the Work which are legally required when bids are received or negotiations concluded, including without limitation electrical, sewer, water, plumbing, and mechanical permits and fees. The Contractor shall be responsible for Subcontractor licenses and costs of doing business in the city and county of the Project.

The Contractor shall be responsible for any renewals of and penalties arising from the building permit and other permits and governmental fees.

G. CONTRACTOR'S CONSTRUCTION SCHEDULES

1 Within ten (10) days after issuance of the Notice to Proceed, the Contractor shall submit a preliminary schedule of the Work. Within fourteen (14) days after issuance of the Notice to Proceed, and before any progress payment need be made, the Contractor, after consultations with its Subcontractors and suppliers of any tier, shall submit one (1) copies of a Contractor's Construction Schedule to the Engineer and one copy to the Owner in electronic format as well as paper. Not less than ten percent of the Progress Payment may be withheld until a Contractor's Construction Schedule in a form satisfactory to the Owner has been submitted. Neither the Owner nor the Engineer will have the responsibility to review the substance of the Contractor's Construction Schedule.

2 The Contractor's Construction Schedule shall be based upon a critical path method ("CPM") analysis of construction activities and sequence of operations needed for the orderly performance and completion of all separable parts of the Work in accordance with the Contract and within the Contract Time. The schedule shall be a critical path method type in the form of a precedence diagram and activity listing, and shall be time-scaled. It shall include the Notice to Proceed date, the Date(s) of Substantial Completion, and the Date(s) of Final Completion in accordance with the Contract Documents. The Critical Path shall be clearly indicated on the Contractor's Construction Schedule. The time-scaled network diagram shall be summarized on a single sheet not to exceed 30" x 42".

2.1 The network diagram shall show in detail and in order the sequence of all significant activities, their descriptions, start and finish dates, durations and dependencies, necessary to complete all Work and any separable parts thereof. Predecessor and successor reports shall also be provided. The activity listing shall show the following information for each activity on the network diagram:

- .1** Description;
- .2** Duration, not to exceed ten (10) working days;
- .3** Trade or craft;
- .4** Equipment (including hours of usage);
- .5** Start and finish dates;
- .6** Total float time and free float time;
- .7** Dates that work must be performed and completed by other contractors or subcontractors to support the Work and the interfaces with such other contractors; and
- .8** Cost-loading, correlated to the Schedule of Values, which, upon approval, shall be used as a basis for determining action on progress payments throughout the Project.

2.2 A schedule for the purchase and receipt of items required for performance of the Work, showing lead times between purchase order placement and delivery dates, shall be integrated with the Contractor's Construction Schedule. The Contractor shall furnish the Owner with copies of all purchase orders and acknowledgments and fabrication, production, and shipping schedules for all major items on the critical path within ten (10) days of Contractor's receipt of each purchase order, acknowledgment or schedule. The Owner shall be not deemed to have approved or accepted any such material, or its schedule, nor deemed to have waived this requirement if some or all of the material is not received.

2.3 Milestone completion dates shall be clearly defined on the Contractor's Construction Schedule.

2.4 If abbreviations are used in the Contractor's Construction Schedule, a legend shall be provided to define all abbreviations.

2.5 The Contractor shall prepare and keep current a schedule of submittals, coordinated with the Contractor's Construction Schedule, which allows the Owner at least ten (10) days to review the submittals.

2.6 The Progress Schedules shall be submitted as both a paper copy and in electronic format on a USB Drive or by email, any of which must include data files that can be loaded onto the Owner's copy

of the scheduling software and be capable of being printed using the latest MS Windows version of Microsoft Project. The Contractor may request to use different project management software, such as Suretrak, but must first receive approval from the Owner, by demonstrating its capabilities. This can be accomplished by submitting a sample CPM printout of similar scope. If the alternative software is accepted, the Contractor will be required to supply the Owner an authorized MS Windows compatible copy of the software with all user support manuals.

2.7 At each construction progress meeting with the Owner, the Contractor shall submit (a) a bar chart schedule coordinated with the CPM schedule (printed from the CPM) and showing the activities planned for the next month, and (b) a report showing actual starts and finishes compared to the original CPM baseline from the previous month. The bar-chart schedule shall show all work activities numbered according to the CPM, any submittal or delivery activities with less than five (5) days' float, and any permitting, testing, or inspection activities by others.

3 Within ten (10) days after receipt by the Owner, one copy of the Contractor's Construction Schedule will be returned to the Contractor with comments. Review by the Owner of the Contractor's Construction Schedule shall not constitute an approval or acceptance of the Contractor's construction means, methods, or sequencing, or its ability to complete the Work in a timely manner.

4 The Contractor shall utilize and comply with the Contractor's Construction Schedule. The Contractor shall not be entitled to any adjustment in the Contract Time, the Contractor's Construction Schedule, or the Contract Sum, or to any additional payment of any sort by reason of the loss or use of any float time, including time between the Contractor's anticipated completion date and end of the Contract Time, whether or not the float time is described as such on the Contractor's Construction Schedule. The Contractor shall not be entitled to any extension of time, compensable or otherwise, for any delay that occurred during any time the Contractor has not timely submitted an updated Construction Schedule as required by the Contract Documents.

5 Should the Contractor fail to meet any scheduled date as shown on the current Contractor's Construction Schedule, the Contractor shall, if requested, be required at its own expense to submit within ten (10) days of the request an updated Contractor's Construction Schedule. If the Contractor's progress indicates to the Owner that the Work will not be Substantially Completed within the Contract Time, the Contractor shall, at its own expense, increase its work force and/or working hours to bring the actual completion dates of the activities into conformance with the Contractor's Construction Schedule and Substantial Completion within the Contract Time. The Contractor shall submit a revised Contractor's Construction Schedule at its own expense within ten (10) days of notice from the Owner that the sequence of work varies significantly from that shown on the Contractor's Construction Schedule showing work to complete on original Contract Time with approved extensions.

6 Schedule Float Utilization. Any float time to activities not on the critical path shall belong to the Project (i.e., the Contractor, and the Owner), and may be used by the Project to optimize its construction process. Any float time between the end of the final construction activity and the final completion date shall belong to the Owner, and may be used by the Owner in determining if additional contract days are to be awarded for changes in the contract or for delays to the contract caused by the Owner. The Contractor will not be entitled to any adjustment in the Contract Time, the Construction Schedule, or the Contract Sum, or to any additional payment of any sort by reason of the Owner's use of float time between the end of the final construction activity and the final completion date or by reason

of the loss or use of any float time, including time between the Contractor's anticipated completion date and end of the Contract Time, whether or not the float time is described as such on the Contractor's Construction Schedule.

7 Meetings. Prior to the issuance of Notice to Proceed and ending with the date of Final Completion of the Work, the Contractor shall attend and participate in and ensure applicable Subcontractors of any tier and suppliers attend and participate in:

- .1 A mandatory pre-construction meeting with the Owner,
- .3 Regular weekly Project status meetings scheduled by the Owner to review progress of the Work, to discuss the Contractor's progress reports, to obtain necessary Owner approvals, and generally to keep the Owner informed and involved in the progress of the Project; and
- .4 Regular on-site meetings scheduled by the Owner to review progress of the Work and other pertinent matters.
- .5 Special meetings called by the Owner.

H. COPIES OF DRAWINGS AND PROJECT MANUALS

The Owner will supply the Contractor, free of charge, one (1) copy of Drawings and Project Manuals. Additional copies may be obtained, free of charge, on the Kitsap County website.

END OF SPECIAL CONDITIONS OF THE CONTRACT SECTION

Certification of Payments to Influence Federal Transactions

U.S. Department of Housing
and Urban Development
Office of Public and Indian Housing

Applicant Name

Program/Activity Receiving Federal Grant Funding

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, Disclosure Form to Report Lobbying, in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

I hereby certify that all the information stated herein, as well as any information provided in the accompaniment herewith, is true and accurate.

Warning: HUD will prosecute false claims and statements. Conviction may result in criminal and/or civil penalties.
(18 U.S.C. 1001, 1010, 1012; 31 U.S.C. 3729, 3802)

Name of Authorized Official	Title
Signature	Date (mm/dd/yyyy)

Certification Regarding Debarment and Suspension

Certification A: Certification Regarding Debarment, Suspension, and Other Responsibility Matters - Primary Covered Transactions

1. The prospective primary participant certifies to the best of its knowledge and belief that its principals;

a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal debarment or agency;

b. Have not within a three-year period preceding this proposal, been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification, or destruction of records, making false statements, or receiving stolen property;

c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and

d. Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

2. Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

Instructions for Certification (A)

1. By signing and submitting this proposal, the prospective primary participant is providing the certification set out below.

2. The inability of a person to provide the certification required below will not necessarily result in denial of participation in this covered transaction. The prospective participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective primary participant to furnish a certification or an explanation shall disqualify such person from participation in this transaction.

3. The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause of default.

4. The prospective primary participant shall provide immediate written notice to the department or agency to whom this proposal is submitted if at any time the prospective primary participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

5. The terms **covered transaction, debarred, suspended, ineligible, lower tier covered transaction, participant, person, primary covered transaction, principal, proposal, and voluntarily excluded**, as used in this clause, have the meanings set out in the Definitions and Coverage sections of the rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is being submitted for assistance in obtaining a copy of these regulations.

6. The prospective primary participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

7. The prospective primary participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

8. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines this eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.

9. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

10. Except for transactions authorized under paragraph (6) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause of default.

Certification B: Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

Instructions for Certification (B)

1. By signing and submitting this proposal, the prospective lower tier participant is providing the certification set out below.
2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.
3. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
4. The terms **covered transaction, debarred, suspended, ineligible, lower tier covered transaction, participant, person, primary covered transaction, principal, proposal, and voluntarily excluded**, as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of these regulations.

5. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.
6. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.
8. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
9. Except for transactions authorized under paragraph (5) of these instructions, if a participant in a lower covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies including suspension and/or debarment.

Applicant		Date
Signature of Authorized Certifying Official		Title

SECTION 000 73 19 – HEALTH AND SAFETY REQUIREMENTS

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Preliminary Work
- B. Imminent Danger
- C. Safety
- D. Safety Responsibilities
- E. Request for Variances
- F. Failure to Comply

1.2 PRELIMINARY WORK

- A. Prior to the start of and during the course of the Work (above and below ground) the Contractor shall make a thorough survey of the work site to determine all potential hazards. Workers shall be made aware of those hazards and shall be instructed in procedures and the use of equipment for their protection. The Contractor shall verify the location and condition ("live" or "dead") of all utilities on and near each work site and take precautions to protect their employees, the general public, and the property.

1.3 IMMINENT DANGER

- A. The Contractor shall be wholly responsible for any accidents (including death) occurring at any time during the progress of the work and until the final acceptance of the work by the Owner which may happen to any of their workers or those of any Subcontractor employed on the building, or for any damage or injuries (including death) which their work and operations may cause to the work being constructed, or to existing buildings, or to any tenants and occupants of the property, or of the adjoining properties, or to the public, or to any public or private property.

1.4 SAFETY

- A. COVID 19 Procedures: The Contractor shall comply with all Washington State Executive Orders and State of Washington regulations including Washington State Department of Labor and Industries requirements concerning health and safety. All costs of compliance with the above requirements as of the bid submittal date shall be included in the Primary and Second bid amounts.
- B. The Contractor shall ensure that all employees, visitors, subcontractors' employees, and suppliers' employees, while on the work site, comply with the requirements of WISHA, and the requirements of the safety precautions contained in these Specifications. The Contractor shall promptly and fully comply with, execute and, without separate charge thereof to the Owner, shall enforce compliance with the provisions of the Washington Industrial Safety and Health Act of 1973, with particular attention paid but not limited to Chapter 296-155, WAC Safety Standards for Construction Work; with particular attention paid but not limited to Chapter 296-24 WAC General Safety and Health

Standards; with particular attention paid but not limited to Chapters 196-350, 296-27 and 296-360 WAC regarding Administrative Safety and Health Act Chapter 49-17 RCW, and any addenda thereto, and to any applicable updates or revisions to such codes.

- C. The Contractor shall immediately advise the Owner of inspections conducted by WISHA at the work site, and shall transmit copies of citations and violations to the Owner.

1.5 SAFETY RESPONSIBILITIES

- A. Contractor shall be responsible to:
 - 1. Ensure compliance with these requirements, WISHA requirements, and any other safety requirements.
 - 2. Authorize immediate action to correct substandard safety conditions.
 - 3. Review and act to ensure compliance with safety procedures with their supervisors, subcontractors, and suppliers.
 - 4. Make thorough daily safety inspections of the work site and immediately act to eliminate unsafe acts and unsafe conditions.
 - 5. Investigate work site accidents and recommend immediate corrective action.
 - 6. Assist in the preparation of accident investigation and reporting procedures.
 - 7. Be responsible for the control, availability, and use of safety equipment, including employee personal protective equipment.
- B. The Contractor shall erect and maintain, as required by existing conditions and progress of the Work, all reasonable and all required safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying users of adjacent utilities.
- C. The Contractor shall not load or permit any part of the Work to be loaded so as to endanger its safety.
- D. When the use or storage of explosives or other hazardous materials or equipment is necessary for the execution of the Work, the Contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel.
- E. The Contractor shall designate a responsible member of its organization at the site whose duty shall be the prevention of accidents and monitoring of the Work to insure compliance with all applicable laws, ordinances, rules, regulations and lawful orders of public authority bearing on the safety of persons or protection of property. This person shall be the Contractor's Superintendent unless otherwise designated by the Contractor in writing to the Owner.
- F. The Contractor shall provide to the Owner its safety plan, all meeting minutes from job site safety meetings, job site safety reports, and any reports concerning safety violations or

injuries/accidents at the job site. The Contractor and its Subcontractors shall cooperate with the Owner and provide safe access for the Architect to review the work.

- G. Any notice given to the Contractor by the Owner, the Architect, or the Owner's Construction Manager of a safety or property protection violation will not; (1) relieve the Contractor of sole and complete responsibility for the violation and the correction thereof, or of sole liability for the consequences of said violation; (2) impose any obligation upon Owner, the Owner's Construction Manager, or Architect to inspect or review Contractor's safety program or precautions or to enforce Contractor's compliance with the requirements of this Section 00804 or (3) impose any continuing obligation upon Owner, the Owner's Construction Manager, and Architect to provide such notice to Contractor or any other person or entity.

1.6 REQUEST FOR VARIANCES

- A. Requests for variances to deviate from WISHA requirements must follow the current established procedures by that Agency.

1.7 FAILURE TO COMPLY

- A. If the project is shut down due to the Contractor's failure to comply with the requirements of WISHA or other applicable safety requirements, no part of the time loss due to any such suspension of operations or stop orders shall be made the subject of a claim for extension of time or for increased cost or damage by the Contractor.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION 000 73 19

SECTION 000 73 20 – SUPPLEMENTAL CONDITIONS ASBESTOS ABATEMENT

PART 1 GENERAL

1.1 PERFORMANCE

A. Definitions

1. "Asbestos" includes different forms of chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite.
2. "Asbestos Project" means the construction, demolition, repair, maintenance or renovation of any building, mechanical piping equipment or system involving the demolition, removal, encapsulation, salvage, or disposal of material which may release asbestos fibers into the air.
3. "Regulations." For purposes of this section regulations shall include but not be limited to regulations of the National Emission Standards for Hazardous Air pollutants (40 CFR 61), Occupational Safety and Health Requirements Pertaining to Asbestos (29 CFR 1910), the regulations of the Washington State Department of Labor and Industries, WAC Chapters 296-62, -65, -155, and Puget Sound Clean Air Agency (PSCAA) regulating asbestos projects as adopted or hereafter amended.

B. Asbestos Products

1. Contractor shall ensure that no asbestos products in any form are incorporated into the Work.

C. Good Faith Inspection

1. Owner has performed a good faith inspection to determine whether the materials to be worked on or removed contain asbestos. A letter of good faith inspection is included at the end of Section 01 11 00. Contractor shall not commence work without receiving a copy of this report.
2. Contractor shall keep the asbestos inspection report on site.
3. The usual policy of the Owner is to identify and abate asbestos before the work begins, unless asbestos abatement is included in the scope of work of these Contract Documents. In limited cases where Owner is reasonably certain that asbestos will not be disturbed, asbestos materials are to remain intact in the work area. These materials would be identified in the asbestos inspection report and Contractor advised of protective measures.

D. Notice

1. If in the course of performing the work, Contractor encounters an asbestos project which was not specifically referenced in the Contract Documents, or disturbs asbestos, Contractor shall immediately stop work and notify Owner.

E. Permits

1. At least ten days before undertaking an asbestos project, Contractor shall submit a Notice of Intent to Remove Asbestos together with the required notification fees to the Puget Sound Clean Air Agency, the Department of Labor and Industries and Owner. Prior to submitting such notice, Contractor shall submit for approval to Owner proposed procedures for undertaking the asbestos project to assure compliance with Owner's performance standards and applicable Regulations.

F. Safety Precautions

1. Contractor shall provide, at Contractor's cost, appropriate clothing, caution signs, supply items, and safety equipment in order to perform asbestos projects in accordance with the regulations and the performance standards of Owner.
2. During the course of performing an asbestos project, Contractor shall monitor the workplace and adjacent areas in accordance with the regulations and the performance standards of Owner to ensure that permissible levels of airborne concentrations of asbestos fibers are not exceeded. The results of all monitoring shall be immediately provided to Owner. If the prescribed exposure limits are exceeded, Contractor shall immediately execute a compliance program of engineering and work practices approved by Owner.

G. Certifications

1. No Contractor or person shall undertake an asbestos project unless certified by the Department of Labor and Industries as a qualified asbestos contractor, supervisor, or worker in accordance with the requirements of WAC Chapter 296-65.

H. Records

1. Contractor shall maintain complete records of personal and environmental monitoring. A copy of these records shall be provided to Owner. Contractor is also required by regulations to arrange for medical examinations for those employees who work on an asbestos project and to maintain those records for at least twenty years.

I. Other Provisions

1. Contractor shall comply with such other and additional requirements regarding asbestos as are set forth in the Contract Documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 000 73 20

SECTION 000 73 43 – WAGE RATE REQUIREMENTS

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. State of Washington Prevailing Wage
- B. Notice of Wage Determination – WAC 296-127-017
- C. Survey Methodology – WAC 296-127-019

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Make particular reference to the following Division One section:
 - 1. Section 000 62 20 – Statement of Intent to Pay Prevailing Wage
 - 2. Section 000 62 30 – Affidavit of Wages Paid
 - 3. Section 01 41 00 – Regulatory Requirements
 - 4. Section 01 77 00 – Closeout Procedure

1.3 STATE OF WASHINGTON PREVAILING WAGE ACT

- A. The provisions of the Washington State Prevailing Wage Act, Chapter 39.12 RCW are hereby incorporated by reference as if fully set forth herein. The failure of the Contractor to comply with each and every provision thereof shall be a breach of this Contract and shall entitle the Owner to pursue any remedies deemed necessary.
- B. The Contractor shall be subject to any amendments to the said statutes whether occurring before or after the execution of the Contract without increase to the Contract Sum.
- C. Under the provisions of RCW 39.12, the hourly wages paid to laborers, workers, or mechanics upon all public works of this State and upon work contemplated in this Contract, shall be not less than the prevailing rate of wage for an hour's work in the same trade or occupation in the locality within the State and County where such labor and work herein contemplated is to be performed, and established by the Department of Labor and Industries.

All laborers, workers or mechanics shall be paid not less than the minimum hourly rate of wage which are incorporated herein provided, however, that nothing herein contained shall be construed to prohibit the Contractor, Subcontractor or other person doing or contracting to do the whole or any part of the work under this Contract, from paying any such laborers, workers or mechanics wages in excess of the hourly minimum rate above specified. If in the event that the hourly rates set forth herein are not the most current, the Contractor shall be responsible to pay the current prevailing wages and include them in its bid.

All laborers, workers or mechanics shall be paid not less than the minimum hourly rate of wage which can be found at the Department of Labor & Industries website, <http://www.lni.wa.gov/TradesLicensing/PrevWage/WageRates/>, subject to the following:

1. The Wage Publication Date ("Effective Date") is Bid date; and
 2. The Public Works Project is located in Kitsap County.
- D. The Owner does not guarantee that the labor can be procured for the minimum wages set forth. The rates of wages listed are minimum only, below which the Contractor cannot pay and they do not constitute a representation the labor can be procured for the minimum listed. It will be the responsibility of the Contractor to ascertain for themselves the wages above the minimum they may have to pay.
- E. The Contractor on or before the date of commencement of work shall file a statement under oath with the Owner and with the Director of Labor and Industries certifying the rate of hourly wage paid and to be paid each classification of laborers, workers, or mechanics employed upon the work by the Contractor or Subcontractor which shall be not less than the prevailing rate of wage. Such statement and any supplemental statements which may be necessary shall be filed in accordance with the practices and procedures required by the Department of Labor and Industries.
- F. Prior to commencing work, each Contractor and each and every Subcontractor shall file a sworn statement of intent with the Owner and with the Department of Labor and Industries as to the prevailing wage rate, including fringe benefits, for each job classification to be utilized. The wage rates thus filed will be checked against the prevailing wage rates as determined by the Industrial Statistician of the Department of Labor and Industries. If the wage rates are correct, the Industrial Statistician will issue an acknowledgment of approval to the Contractor and/or Subcontractor with a copy to the awarding agency (Owner). If any incorrect wage rates are included, the Contractor and/or subcontractor will be notified of the correct rates by the Industrial Statistician and approval will be withheld until a correct statement is received. If the State Affidavit Form S.F. 9843 is used for filing a statement of intent, it must be conspicuously noted thereon that it is a preliminary filing only.
- G. Copies of wage rate approvals will be furnished to the awarding agency, and the Contractor (and the Prime Contractor in the case of Subcontractor) by the Industrial Statistician.
- H. Each voucher claim submitted by a Contractor for payment on a project estimate shall state that prevailing wages have been paid in accordance with the pre-filed statement or statements of intent on file with the Department of Labor and Industries as approved by the Industrial Statistician.
- I. At the conclusion of the project, the Contractor and its Subcontractors shall submit affidavits of wages paid to the Industrial Relations Division, Department of Labor, and Industries, General Administration Building, Olympia, Washington, 98501, for certification by the Director. SF. 9843 "Affidavit of Wages Paid" or on a similarly constructed form should be filed to secure the Director's certification. The "Affidavit of Wages Paid" must be certified by the Industrial Statistician and received by the Owner prior to the release of any retained funds.
- J. The Contractor shall pay all fees charged by the Department of Labor and Industries for the approval, review and certification of the "Statement of the Intent to Pay Prevailing Wages" forms and the "Affidavit of Wages Paid" form.
- K. Above reporting procedures shall be expanded and/or supplemented if required by Department of Labor and Industries.
- L. Copies of the approved Intent to Pay Prevailing Wage Statements shall be posted at the job site where the workers can easily read them. The address and telephone number of the Industrial

Statistician of the Department of Labor and Industries where a complaint or inquiry concerning prevailing wages may be made shall also be posted at the job site.

M. EIGHT HOUR LAW AND PAYMENTS FOR LABOR - Chapter 49.28 RCW

The Contractor agrees that no laborer, worker or mechanic in the employ of the Contractor, Subcontractor, or other person doing or contracting to do the whole or any part of the work contemplated by this Contract, shall be permitted or required to work more than eight (8) hours in any one calendar day, provided that in cases of extraordinary emergency, such as danger to life or property, the hours of work may be extended, but in such cases the rate of pay for the time employed in excess of eight (8) hours of each calendar day shall be not less than one and one half times the rate allowed for this same amount of time during eight hours service. Any work necessary to be performed after regular working hours, or Sunday or legal holidays, shall be performed without additional expense to the Owner.

1.4 NOTICE OF WAGE DETERMINATION - WAC 296-127-017

A. Contractor must use not less than the Washington State Prevailing Wage rates in effect at the time of bid opening.

B. Washington State Prevailing Wage rate data can be accessed online at:

<https://www.lni.wa.gov/licensing-permits/public-works-projects/prevailing-wage-rates/>

or will be furnished by the industrial statistician upon request. Please mail request to:

Department of Labor and Industries
Prevailing Wage Rate Section
P.O. Box 44540
Olympia, WA. 98504 - 4540
Telephone: (855) 545-8163

C. Journey Level Prevailing Wage data is bound herein.

D. Apprentice Level Prevailing Wage is bound herein.

E. Benefit Code Key is bound herein.

1.5 FEDERAL LABOR STANDARDS PROVISIONS DAVIS BACON

A. This project is required to meet Federal Labor Standards Provisions Davis Bacon wage laws as explained in HUD-4010 Federal Labor Standards Provisions (attached). All work performed on the project will be subject to the approved federal wage determination rates in Wage Decision Number WA20220012. The most recent Wage Decision publication will be used prior to the bid opening date any such modification will replace the one included in the bid packet.

B. The work to be performed on this project is subject to the requirements of section 3 of the Housing and Urban Development Act of 1968, 12 U.S.C. 1701 U (section 3). The purpose of section 3 is to ensure that employment and other economic opportunities generated by HUD assistance shall to the greatest extent feasible, be directed to low-and very low-income persons. Section 3 businesses are encouraged to submit bid proposals.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION 000 73 43

ATTACHMENTS

1. Journey Level Prevailing Wage
2. Apprentice Level Prevailing Wage
3. Benefit Code Key
4. HUD-4010 Federal Labor Standards Provisions
5. Federal Wage Decision Number WA 20220012 (will be updated prior to bid opening date)

JOURNEY LEVEL PREVAILING WAGE RATES FOR KITSAP COUNTY

State of Washington
Department of Labor & Industries
Prevailing Wage Section - Telephone 360-902-5335
PO Box 44540, Olympia, WA 98504-4540

Washington State Prevailing Wage

The PREVAILING WAGES listed here include both the hourly wage rate and the hourly rate of fringe benefits. On public works projects, worker's wage and benefit rates must add to not less than this total. A brief description of overtime calculation requirements are provided on the Benefit Code Key.

Journey Level Prevailing Wage Rates for the Effective Date: BID DUE DATE

<https://secure.lni.wa.gov/wagelookup/>

Important Note about Rates: Choosing correct worker classifications depends upon *determinations* published by L&I. Review our Determinations by visiting the following website <https://lni.wa.gov/licensing-permits/public-works-projects/prevailing-wage-policies>

Look up Prevailing Wage rates with effective dates as far back as March 4, 1998.

Which rates (effective date) should you select?

The prevailing wage rates, in a particular county, are determined by the **bid due date** for a public works project and these rates apply to that project until it is completed, unless the **contract award date** is six months or more after the bid due date. In this case the award date would determine the rates to be paid. The bid due date is the date that General Contractor bids for the project are due to the Awarding Agency. All sub-contractors use this same bid due date and award date.

When are Prevailing Wage rates updated?

Updated Prevailing Wage rates are published twice each year:
The first business day of February (effective 30 days later).
The first business day of August (effective 30 days later).

Select County

Adams	▲
Asotin	
Benton	
Chelan	
Clallam	
Clark	
Columbia	
Cowlitz	
Douglas	
Ferry	▼

Select Trade

Boilermakers	▲
Brick And Marble Masons	
Brick Mason	
Bricklayers & Marble Masons	
Building Service Employees	
Cabinet Makers (In Shop)	
Carpenters	
Cement Masons	
Divers & Tenders	▼

END OF ATTACHMENT 1

APPRENTICE LEVEL PREVAILING WAGE RATES FOR KITSAP COUNTY

State of Washington
Department of Labor & Industries
Prevailing Wage Section - Telephone 360-902-5335
PO Box 44540, Olympia, WA 98504-4540

Apprentice Level Prevailing Wage Rates for Kitsap County
for the Effective Date: BID DUE DATE

<https://secure.lni.wa.gov/wagelookup/ApprenticeWageLookup.aspx>

Apprentices are defined as those workers for whom an apprenticeship agreement has been registered and approved by the state apprenticeship council. Under this law, any “helper” or other type of assistant who is not registered with the Washington State Apprenticeship and Training Council (WSATC) is to be considered a fully qualified journey level worker and must be paid the full journey-level wage. Workers registered with the WSATC are entitled to the prevailing wage rates for an apprentice of that trade.

Important Note about Rates: Choosing correct worker classifications depends upon *determinations* published by L&I. Review our Determinations by visiting the following website
<https://lni.wa.gov/licensing-permits/public-works-projects/prevailing-wage-policies>

Look up Prevailing Wage rates with effective dates as far back as March 4, 1998.

⊖ Which rates (effective date) should you select?

The prevailing wage rates, in a particular county, are determined by the **bid due date** for a public works project and these rates apply to that project until it is completed, unless the **contract award date** is six months or more after the bid due date. In this case the award date would determine the rates to be paid. The bid due date is the date that General Contractor bids for the project are due to the Awarding Agency. All sub-contractors use this same bid due date and award date.

⊖ When are Prevailing Wage rates updated?

Updated Prevailing Wage rates are published twice each year:
The first business day of February (effective 30 days later).
The first business day of August (effective 30 days later).

Select County

Kitsap ▼

Select Trade

Brick And Marble Masons ▼

END OF ATTACHMENT 2

Benefit Code Key – Effective 8/31/2023 thru 3/1/2024

Overtime Codes

Overtime calculations are based on the hourly rate actually paid to the worker. On public works projects, the hourly rate must be not less than the prevailing rate of wage minus the hourly rate of the cost of fringe benefits actually provided for the worker.

1. ALL HOURS WORKED IN EXCESS OF EIGHT (8) HOURS PER DAY OR FORTY (40) HOURS PER WEEK SHALL BE PAID AT ONE AND ONE-HALF TIMES THE HOURLY RATE OF WAGE.
 - B. All hours worked on Saturdays shall be paid at one and one-half times the hourly rate of wage. All hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.
 - C. The first two (2) hours after eight (8) regular hours Monday through Friday and the first ten (10) hours on Saturday shall be paid at one and one-half times the hourly rate of wage. All other overtime hours and all hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.
 - D. The first two (2) hours before or after a five-eight (8) hour workweek day or a four-ten (10) hour workweek day and the first eight (8) hours worked the next day after either workweek shall be paid at one and one-half times the hourly rate of wage. All additional hours worked and all worked on Sundays and holidays shall be paid at double the hourly rate of wage.
 - E. The first two (2) hours after eight (8) regular hours Monday through Friday and the first eight (8) hours on Saturday shall be paid at one and one-half times the hourly rate of wage. All other hours worked Monday through Saturday, and all hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.
 - F. The first two (2) hours after eight (8) regular hours Monday through Friday and the first ten (10) hours on Saturday shall be paid at one and one-half times the hourly rate of wage. All other overtime hours worked, except Labor Day, shall be paid at double the hourly rate of wage. All hours worked on Labor Day shall be paid at three times the hourly rate of wage.
 - G. The first ten (10) hours worked on Saturdays and the first ten (10) hours worked on a fifth calendar weekday in a four-ten hour schedule, shall be paid at one and one-half times the hourly rate of wage. All hours worked in excess of ten (10) hours per day Monday through Saturday and all hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.
 - H. All hours worked on Saturdays (except makeup days if work is lost due to inclement weather conditions or equipment breakdown) shall be paid at one and one-half times the hourly rate of wage. All hours worked Monday through Saturday over twelve (12) hours and all hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.
 - I. All hours worked on Sundays and holidays shall also be paid at double the hourly rate of wage.
 - J. The first two (2) hours after eight (8) regular hours Monday through Friday and the first ten (10) hours on Saturday shall be paid at one and one-half times the hourly rate of wage. All hours worked over ten (10) hours Monday through Saturday, Sundays and holidays shall be paid at double the hourly rate of wage.
 - K. All hours worked on Saturdays and Sundays shall be paid at one and one-half times the hourly rate of wage. All hours worked on holidays shall be paid at double the hourly rate of wage.
 - M. All hours worked on Saturdays (except makeup days if work is lost due to inclement weather conditions) shall be paid at one and one-half times the hourly rate of wage. All hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.
 - N. All hours worked on Saturdays (except makeup days) shall be paid at one and one-half times the hourly rate of wage. All hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.

Overtime Codes Continued

1. O. The first ten (10) hours worked on Saturday shall be paid at one and one-half times the hourly rate of wage. All hours worked on Sundays, holidays and after twelve (12) hours, Monday through Friday and after ten (10) hours on Saturday shall be paid at double the hourly rate of wage.
- P. All hours worked on Saturdays (except makeup days if circumstances warrant) and Sundays shall be paid at one and one-half times the hourly rate of wage. All hours worked on holidays shall be paid at double the hourly rate of wage.
- Q. The first two (2) hours after eight (8) regular hours Monday through Friday and up to ten (10) hours worked on Saturdays shall be paid at one and one-half times the hourly rate of wage. All hours worked in excess of ten (10) hours per day Monday through Saturday and all hours worked on Sundays and holidays (except Christmas day) shall be paid at double the hourly rate of wage. All hours worked on Christmas day shall be paid at two and one-half times the hourly rate of wage.
- R. All hours worked on Sundays and holidays shall be paid at two times the hourly rate of wage.
- U. All hours worked on Saturdays shall be paid at one and one-half times the hourly rate of wage. All hours worked on Sundays and holidays (except Labor Day) shall be paid at two times the hourly rate of wage. All hours worked on Labor Day shall be paid at three times the hourly rate of wage.
- V. All hours worked on Sundays and holidays (except Thanksgiving Day and Christmas day) shall be paid at one and one-half times the hourly rate of wage. All hours worked on Thanksgiving Day and Christmas day shall be paid at double the hourly rate of wage.
- W. All hours worked on Saturdays and Sundays (except make-up days due to conditions beyond the control of the employer) shall be paid at one and one-half times the hourly rate of wage. All hours worked on holidays shall be paid at double the hourly rate of wage.
- X. The first four (4) hours after eight (8) regular hours Monday through Friday and the first twelve (12) hours on Saturday shall be paid at one and one-half times the hourly rate of wage. All hours worked over twelve (12) hours Monday through Saturday, Sundays and holidays shall be paid at double the hourly rate of wage. When holiday falls on Saturday or Sunday, the day before Saturday, Friday, and the day after Sunday, Monday, shall be considered the holiday and all work performed shall be paid at double the hourly rate of wage.
- Y. All hours worked outside the hours of 5:00 am and 5:00 pm (or such other hours as may be agreed upon by any employer and the employee) and all hours worked in excess of eight (8) hours per day (10 hours per day for a 4 x 10 workweek) and on Saturdays and holidays (except labor day) shall be paid at one and one-half times the hourly rate of wage. (except for employees who are absent from work without prior approval on a scheduled workday during the workweek shall be paid at the straight-time rate until they have worked 8 hours in a day (10 in a 4 x 10 workweek) or 40 hours during that workweek.) All hours worked Monday through Saturday over twelve (12) hours and all hours worked on Sundays and Labor Day shall be paid at double the hourly rate of wage.
- Z. All hours worked on Saturdays and Sundays shall be paid at one and one-half times the hourly rate of wage. All hours worked on holidays shall be paid the straight time rate of pay in addition to holiday pay.

Overtime Codes Continued

2. ALL HOURS WORKED IN EXCESS OF EIGHT (8) HOURS PER DAY OR FORTY (40) HOURS PER WEEK SHALL BE PAID AT ONE AND ONE-HALF TIMES THE HOURLY RATE OF WAGE.
- B. All hours worked on holidays shall be paid at one and one-half times the hourly rate of wage.
 - F. The first eight (8) hours worked on holidays shall be paid at the straight hourly rate of wage in addition to the holiday pay. All hours worked in excess of eight (8) hours on holidays shall be paid at double the hourly rate of wage.
 - M. This code appears to be missing. All hours worked on Saturdays, Sundays and holidays shall be paid at double the hourly rate of wage.
 - R. All hours worked on Sundays and holidays and all hours worked over sixty (60) in one week shall be paid at double the hourly rate of wage.
 - U. All hours worked on Saturdays shall be paid at one and one-half times the hourly rate of wage. All hours worked over 12 hours in a day or on Sundays and holidays shall be paid at double the hourly rate of wage.
3. ALL HOURS WORKED IN EXCESS OF EIGHT (8) HOURS PER DAY OR FORTY (40) HOURS PER WEEK SHALL BE PAID AT ONE AND ONE-HALF TIMES THE HOURLY RATE OF WAGE.
- F. All hours worked on Saturday shall be paid at one and one-half times the hourly rate of wage. All hours worked on Sunday shall be paid at two times the hourly rate of wage. All hours worked on paid holidays shall be paid at two and one-half times the hourly rate of wage including holiday pay.
 - H. All work performed on Sundays between March 16th and October 14th and all Holidays shall be compensated for at two (2) times the regular rate of pay. Work performed on Sundays between October 15th and March 15th shall be compensated at one and one half (1-1/2) times the regular rate of pay.
 - J. All hours worked between the hours of 10:00 pm and 5:00 am, Monday through Friday, and all hours worked on Saturdays shall be paid at a one and one-half times the hourly rate of wage. All hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.
 - K. Work performed in excess of eight (8) hours of straight time per day, or ten (10) hours of straight time per day when four ten (10) hour shifts are established, or forty (40) hours of straight time per week, Monday through Friday, or outside the normal 5 am to 6pm shift, and all work on Saturdays shall be paid at one and one-half times the hourly rate of wage. All work performed after 6:00 pm Saturday to 5:00 am Monday and Holidays, and all hours worked in excess of twelve (12) hours in a single shift shall be paid at double the hourly rate of wage.

After an employee has worked eight (8) hours at an applicable overtime rate, all additional hours shall be at the applicable overtime rate until such time as the employee has had a break of eight (8) hours or more. When an employee returns to work without at least eight (8) hours time off since their previous shift, all such time shall be a continuation of shift and paid at the applicable overtime rate until he/she shall have the eight (8) hours rest period.

Overtime Codes Continued

4. ALL HOURS WORKED IN EXCESS OF EIGHT (8) HOURS PER DAY OR FORTY (40) HOURS PER WEEK SHALL BE PAID AT ONE AND ONE-HALF TIMES THE HOURLY RATE OF WAGE.

- A. All hours worked in excess of eight (8) hours per day or forty (40) hours per week shall be paid at double the hourly rate of wage. All hours worked on Saturdays, Sundays and holidays shall be paid at double the hourly rate of wage
- C. On Monday through Friday, the first four (4) hours of overtime after eight (8) hours of straight time work shall be paid at one and one half (1-1/2) times the straight time rate of pay, unless a four (4) day ten (10) hour workweek has been established. On a four (4) day ten (10) hour workweek scheduled Monday through Thursday, or Tuesday through Friday, the first two (2) hours of overtime after ten (10) hours of straight time work shall be paid at one and one half (1-1/2) times the straight time rate of pay. On Saturday, the first twelve (12) hours of work shall be paid at one and one half (1-1/2) times the straight time rate of pay, except that if the job is down on Monday through Friday due to weather conditions or other conditions outside the control of the employer, the first ten (10) hours on Saturday may be worked at the straight time rate of pay. All hours worked over twelve (12) hours in a day and all hours worked on Sunday and Holidays shall be paid at two (2) times the straight time rate of pay.
- D. All hours worked in excess of eight (8) hours per day or forty (40) hours per week shall be paid at double the hourly rate of wage. All hours worked on Saturday, Sundays and holidays shall be paid at double the hourly rate of pay. Rates include all members of the assigned crew.

EXCEPTION:

On all multipole structures and steel transmission lines, switching stations, regulating, capacitor stations, generating plants, industrial plants, associated installations and substations, except those substations whose primary function is to feed a distribution system, will be paid overtime under the following rates:

The first two (2) hours after eight (8) regular hours Monday through Friday of overtime on a regular workday, shall be paid at one and one-half times the hourly rate of wage. All hours in excess of ten (10) hours will be at two (2) times the hourly rate of wage. The first eight (8) hours worked on Saturday will be paid at one and one-half (1-1/2) times the hourly rate of wage. All hours worked in excess of eight (8) hours on Saturday, and all hours worked on Sundays and holidays will be at the double the hourly rate of wage.

All overtime eligible hours performed on the above described work that is energized, shall be paid at the double the hourly rate of wage.

- E. The first two (2) hours after eight (8) regular hours Monday through Friday and the first eight (8) hours on Saturday shall be paid at one and one-half times the hourly rate of wage. All other hours worked Monday through Saturday, and all hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.

On a four-day, ten-hour weekly schedule, either Monday thru Thursday or Tuesday thru Friday schedule, all hours worked after ten shall be paid at double the hourly rate of wage. The Monday or Friday not utilized in the normal four-day, ten hour work week, and Saturday shall be paid at one and one half (1½) times the regular shift rate for the first eight (8) hours. All other hours worked Monday through Saturday, and all hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.
- G. All hours worked on Saturdays shall be paid at one and one-half times the hourly rate of wage. All hours worked Monday through Saturday over twelve (12) hours and all hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.
- I. The First eight (8) hours worked on Saturdays shall be paid at one and one-half times the hourly rate of wage. All hours worked in excess of eight (8) per day on Saturdays shall be paid at double the hourly rate of wage. All hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.

Overtime Codes Continued

4. J. The first eight (8) hours worked on a Saturday shall be paid at one and one-half times the hourly rate of wage. All hours worked in excess of eight (8) hours on a Saturday shall be paid at double the hourly rate of wage. All hours worked over twelve (12) in a day, and all hours worked on Sundays and Holidays shall be paid at double the hourly rate of wage.
- K. All hours worked on a Saturday shall be paid at one and one-half times the hourly rate of wage, so long as Saturday is the sixth consecutive day worked. All hours worked over twelve (12) in a day Monday through Saturday, and all hours worked on Sundays and Holidays shall be paid at double the hourly rate of wage.
- L. The first twelve (12) hours worked on a Saturday shall be paid at one and one-half times the hourly rate of wage. All hours worked on a Saturday in excess of twelve (12) hours shall be paid at double the hourly rate of pay. All hours worked over twelve (12) in a day Monday through Friday, and all hours worked on Sundays shall be paid at double the hourly rate of wage. All hours worked on a holiday shall be paid at one and one-half times the hourly rate of wage, except that all hours worked on Labor Day shall be paid at double the hourly rate of pay.
- S. On a four (4) day ten (10) hour workweek scheduled Monday through Thursday, or Tuesday through Friday, work performed in excess of (10) hours shall be paid at one and one half (1-1/2) times the hourly rate of pay. On Monday through Friday, work performed outside the normal work hours of 6:00 a.m. and 6:00 p.m. shall be paid at one and one-half (1-1/2) times the straight time rate, (except for special shifts or multiple shift operations).
- All hours worked on Saturdays shall be paid at one and one-half times the hourly rate of wage. All work performed on Sundays and holidays shall be paid at double the hourly rate of wage. When an employee returns to work without at least eight (8) hours time off since their previous shift, all such time shall be a continuation of shift and paid at the applicable overtime rate until such time as the employee has had a break of eight (8) hours.
- Multiple Shift Operations: When the first shift of a multiple shift (a two or three shift) operation is started at the basic straight time rate or at a specific overtime rate, all shifts of that day's operation shall be completed at that rate. Special Shifts: The Special Shift Premium is the basic hourly rate of pay plus \$2.00 an hour. When due to conditions beyond the control of the employer or when an owner (not acting as the contractor), a government agency or the contract specifications require more than four (4) hours of a special shift can only be performed outside the normal 6am to 6pm shift then the special shift premium will be applied to the basic straight time for the entire shift. When an employee works on a special shift, they shall be paid the special shift premium for each hour worked unless they are in overtime or double-time status. (For example, the special shift premium does not waive the overtime requirements for work performed on Saturday or Sunday).
- U. The first four (4) hours after eight (8) regular hours Monday through Friday and the first twelve (12) hours on Saturday shall be paid at one and one-half times the hourly rate of wage. (Except on makeup days if work is lost due to inclement weather, then the first eight (8) hours on Saturday may be paid the regular rate.) All hours worked over twelve (12) hours Monday through Saturday, and all hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.

Overtime Codes Continued

4. V. Work performed in excess of ten (10) hours of straight time per day when four ten (10) hour shifts are established or outside the normal shift (5 am to 6pm), and all work on Saturdays, except for make-up days shall be paid at time and one-half (1 ½) the straight time rate.

In the event the job is down due to weather conditions, then Saturday may, be worked as a voluntary make-up day at the straight time rate. However, Saturday shall not be utilized as a make-up day when a holiday falls on Friday. All work performed on Sundays and holidays and work in excess of twelve (12) hours per day shall be paid at double (2x) the straight time rate of pay.

After an employee has worked eight (8) hours at an applicable overtime rate, all additional hours shall be at the applicable overtime rate until such time as the employee has had a break of eight (8) hours.

When an employee returns to work without a break of eight (8) hours since their previous shift, all such time shall be a continuation of shift and paid at the applicable overtime rate until such time as the employee has had a break of eight (8) hours.

- X. All hours worked on Saturdays shall be paid at one and one-half times the hourly rate of wage. All hours worked on Sundays and holidays shall be paid at double the hourly rate of wage. Work performed outside the normal shift of 6 am to 6pm shall be paid at one and one-half the straight time rate, (except for special shifts or three shift operations). All work performed on Sundays and holidays shall be paid at double the hourly rate of wage. Shifts may be established when considered necessary by the Employer.

The Employer may establish shifts consisting of eight (8) or ten (10) hours of work (subject to WAC 296-127-022), that shall constitute a normal forty (40) hour work week. The Employer can change from a 5-eight to a 4-ten hour schedule or back to the other. All hours of work on these shifts shall be paid for at the straight time hourly rate. Work performed in excess of eight hours (or ten hours per day (subject to WAC 296-127-022) shall be paid at one and one-half the straight time rate.

When due to conditions beyond the control of the Employer, or when contract specifications require that work can only be performed outside the regular day shift, then by mutual agreement a special shift may be worked at the straight time rate, eight (8) hours work for eight (8) hours pay. The starting time shall be arranged to fit such conditions of work.

When an employee returns to work without at a break of eight (8) hours since their previous shift, all such time shall be a continuation of shift and paid at the applicable overtime rate until such time as the employee has had a break of eight (8) hours.

11. ALL HOURS WORKED IN EXCESS OF EIGHT (8) HOURS PER DAY OR FORTY (40) HOURS PER WEEK SHALL BE PAID AT ONE AND ONE-HALF TIMES THE HOURLY RATE OF WAGE.

- B After an employee has worked eight (8) hours, all additional hours worked shall be paid at the applicable overtime rate until such time as the employee has had a break of eight (8) hours or more.

- C The first two (2) hours after eight (8) regular hours Monday through Friday and the first eight (8) hours on Saturday shall be paid at one and one-half times the hourly rate of wage. All other overtime hours worked, except Labor Day, and all hours on Sunday shall be paid at double the hourly rate of wage. All hours worked on Labor Day shall be paid at three times the hourly rate of wage. All non-overtime and non-holiday hours worked between 4:00 pm and 5:00 am, Monday through Friday, shall be paid at a premium rate of 15% over the hourly rate of wage.

Overtime Codes Continued

11. D. All hours worked on Saturdays and holidays shall be paid at one and one-half times the hourly rate of wage. All hours worked on Sundays shall be paid at double the hourly rate of wage.
- After an employee has worked eight (8) hours, all additional hours worked shall be paid at the applicable overtime rate until such time as the employee has had a break of eight (8) hours or more.
- E. The first two (2) hours after eight (8) regular hours Monday through Friday, the first ten (10) hours on Saturday, and the first ten (10) hours worked on Holidays shall be paid at one and one-half times the hourly rate of wage. All hours worked over ten (10) hours Monday through Saturday, and Sundays shall be paid at double the hourly rate of wage.
- After an employee has worked eight (8) hours, all additional hours worked shall be paid at the applicable overtime rate until such time as the employee has had a break of eight (8) hours or more.
- F. The first two (2) hours after eight (8) regular hours Monday through Friday and the first eight (8) hours on Saturday shall be paid at one and one-half times the hourly rate of wage. All other hours worked Monday through Saturday, and all hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.
- On a four-day, ten-hour weekly schedule, either Monday thru Thursday or Tuesday thru Friday schedule, all hours worked after ten shall be paid at double the hourly rate of wage. The Monday or Friday not utilized in the normal four-day, ten hour work week, and Saturday shall be paid at one-half times the hourly rate of wage for the first eight (8) hours. All other hours worked Monday through Saturday, and all hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.
- G. Work performed in excess of eight (8) hours of straight time per day, or ten (10) hours of straight time per day when four ten (10) hour shifts are established, or forty (40) hours of straight time per week, Monday through Friday, or outside the normal 5 am to 6pm shift, and all work on Saturdays shall be paid at one and one-half times the hourly rate of wage.
- All work performed after 6:00 pm Saturday to 5:00 am Monday and Holidays, and all hours worked in excess of twelve (12) hours in a single shift shall be paid at double the hourly rate of wage.
- After an employee has worked eight (8) hours at an applicable overtime rate, all additional hours shall be at the applicable overtime rate until such time as the employee has had a break of nine (9) hours or more. When an employee returns to work without at least nine (9) hours time off since their previous shift, all such time shall be a continuation of shift and paid at the applicable overtime rate until he/she shall have the nine (9) hours rest period.
- H. Work performed in excess of eight (8) hours of straight time per day, or ten (10) hours of straight time per day when four ten (10) hour shifts are established, or forty (40) hours of straight time per week, Monday through Friday, or outside the normal 5 am to 6pm shift, and all work on Saturdays shall be paid at one and one-half times the hourly rate of wage.
- All work performed after 6:00 pm Saturday to 5:00 am Monday and Holidays, and all hours worked in excess of twelve (12) hours in a single shift shall be paid at double the hourly rate of wage.
- After an employee has worked eight (8) hours at an applicable overtime rate, all additional hours shall be at the applicable overtime rate until such time as the employee has had a break of ten (10) hours or more. When an employee returns to work without at least ten (10) hours time off since their previous shift, all such time shall be a continuation of shift and paid at the applicable overtime rate until he/she shall have the ten (10) hours rest period.

Overtime Codes Continued

11. J. All hours worked on holidays shall be paid at double the hourly rate of wage.
- K. On Monday through Friday hours worked outside 4:00 am and 5:00 pm, and the first two (2) hours after eight (8) hours worked shall be paid at one and one-half times the hourly rate. All hours worked over 10 hours per day Monday through Friday, and all hours worked on Saturdays, Sundays, and Holidays worked shall be paid at double the hourly rate of wage.
- L. An employee working outside 5:00 am and 5:00 pm shall receive an additional two dollar (\$2.00) per hour for all hours worked that shift. All hours worked on holidays shall be paid at one and one-half times the hourly rate of wage. All hours worked on holidays shall be paid at one and one-half times the hourly rate of wage.
- M. On Monday through Friday, the first four (4) hours of overtime after eight (8) hours of straight time work shall be paid at one and one half (1-1/2) times the straight time rate of pay, unless a four (4) day ten (10) hour workweek has been established. On a four (4) day ten (10) hour workweek scheduled Monday through Thursday, or Tuesday through Friday, the first two (2) hours of overtime after ten (10) hours of straight time work shall be paid at one and one half (1-1/2) times the straight time rate of pay.
- Work performed outside the normal work hours of 5:00 a.m. and 6:00 p.m. shall be paid at one and one-half (1-1/2) times the straight time rate, (except for special shifts or multiple shift operations). When the first shift of a multiple shift (a two or three shift) operation is started at the basic straight time rate or at a specific overtime rate, all shifts of that day's operation shall be completed at that rate. When due to conditions beyond the control of the Employer or when contract specifications require that work can only be performed outside the regular day shift of 5:00 am to 6:00 pm, then a special shift may be worked at the straight time rate, plus the shift pay premium when applicable. The starting time of work will be arranged to fit such conditions of work. Such shift shall consist of eight (8) hours work for eight (8) hours pay or ten (10) hours work for ten (10) hours pay for four ten shifts.
- On Saturday, the first twelve (12) hours of work shall be paid at one and one half (1-1/2) times the straight time rate of pay. All work performed after 6:00 pm Saturday to 5:00 am Monday, all work performed over twelve (12) hours, and all work performed on holidays shall be paid at double the straight time rate of pay.
- Shift Pay Premium: In an addition to any overtime already required, all hours worked between the hours of 6:00 pm and 5:00 am shall receive an additional two dollars (\$2.00) per hour.
- N. All work performed over twelve hours in a shift and all work performed on Sundays and Holidays shall be paid at double the straight time rate.
- Any time worked over eight (8) hours on Saturday shall be paid double the straight time rate, except employees assigned to work six 10-hour shifts per week shall be paid double the straight time rate for any time worked on Saturday over 10 hours.
- O. All work performed on Saturdays, Sundays, and Holidays shall be paid at one and one half (1-1/2) times the straight time rate of pay.

Benefit Code Key – Effective 8/31/2023 thru 3/1/2024

Holiday Codes

- 5. A. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday after Thanksgiving Day, and Christmas Day (7).
- B. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday after Thanksgiving Day, the day before Christmas, and Christmas Day (8).
- C. Holidays: New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, And Christmas Day (8).
- D. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday and Saturday after Thanksgiving Day, And Christmas Day (8).
- H. Holidays: New Year's Day, Memorial Day, Independence Day, Thanksgiving Day, the Day after Thanksgiving Day, And Christmas (6).
- I. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day (6).
- K. Holidays: New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday After Thanksgiving Day, The Day Before Christmas, And Christmas Day (9).
- L. Holidays: New Year's Day, Martin Luther King Jr. Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday after Thanksgiving Day, And Christmas Day (8).
- N. Holidays: New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Veterans' Day, Thanksgiving Day, The Friday After Thanksgiving Day, And Christmas Day (9).
- P. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday And Saturday After Thanksgiving Day, The Day Before Christmas, And Christmas Day (9). If A Holiday Falls On Sunday, The Following Monday Shall Be Considered As A Holiday.
- Q. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day (6).
- R. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Day After Thanksgiving Day, One-Half Day Before Christmas Day, And Christmas Day. (7 1/2).
- S. Paid Holidays: New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, And Christmas Day (7).
- Z. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day, the Friday after Thanksgiving Day, And Christmas Day (8).
- 6. G. Paid Holidays: New Year's Day, Martin Luther King Jr. Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Veterans' Day, Thanksgiving Day, the Friday after Thanksgiving Day, Christmas Day, and Christmas Eve Day (11).
- H. Paid Holidays: New Year's Day, New Year's Eve Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday After Thanksgiving Day, Christmas Day, The Day After Christmas, And A Floating Holiday (10).

Benefit Code Key – Effective 8/31/2023 thru 3/1/2024

Holiday Codes Continued

6. T. Paid Holidays: New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, The Friday After Thanksgiving Day, The Last Working Day Before Christmas Day, And Christmas Day (9).
- Z. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday after Thanksgiving Day, And Christmas Day (7). If a holiday falls on Saturday, the preceding Friday shall be considered as the holiday. If a holiday falls on Sunday, the following Monday shall be considered as the holiday.
7. A. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday and Saturday after Thanksgiving Day, And Christmas Day (8). Any Holiday Which Falls On A Sunday Shall Be Observed As A Holiday On The Following Monday. If any of the listed holidays falls on a Saturday, the preceding Friday shall be a regular work day.
- B. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday and Saturday after Thanksgiving Day, And Christmas Day (8). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.
- C. Holidays: New Year's Day, Martin Luther King Jr. Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, And Christmas Day (8). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.
- D. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, the Friday after Thanksgiving Day, And Christmas Day (8). Unpaid Holidays: President's Day. Any paid holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any paid holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.
- E. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, And Christmas Day (7). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.
- F. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, the last working day before Christmas day and Christmas day (8). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.
- G. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day (6). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday.
- H. Holidays: New Year's Day, Martin Luther King Jr. Day, Independence Day, Memorial Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, the Last Working Day before Christmas Day and Christmas Day (9). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.
- I. Holidays: New Year's Day, President's Day, Independence Day, Memorial Day, Labor Day, Thanksgiving Day, The Friday After Thanksgiving Day, The Day Before Christmas Day And Christmas Day (9). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.

Holiday Codes Continued

7. J. Holidays: New Year's Day, Independence Day, Memorial Day, Labor Day, Thanksgiving Day and Christmas Day (6). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.
- K. Holidays: New Year's Day, Memorial Day, Independence Day, Thanksgiving Day, the Friday and Saturday after Thanksgiving Day, And Christmas Day (8). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.
- L. Holidays: New Year's Day, Memorial Day, Labor Day, Independence Day, Thanksgiving Day, the Last Work Day before Christmas Day, And Christmas Day (7). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.
- N. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, And Christmas Day (7). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. When Christmas falls on a Saturday, the preceding Friday shall be observed as a holiday.
- P. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday after Thanksgiving Day, And Christmas Day (7). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday.
- Q. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, the Last Working Day before Christmas Day and Christmas Day (8). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. If any of the listed holidays falls on a Saturday, the preceding Friday shall be a regular work day.
- S. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday after Thanksgiving Day, Christmas Day, the Day after Christmas, and A Floating Holiday (9). If any of the listed holidays falls on a Sunday, the day observed by the Nation shall be considered a holiday and compensated accordingly.
- V. Holidays: New Year's Day, President's Birthday, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, Christmas Day, the day before or after Christmas, and the day before or after New Year's Day. If any of the above listed holidays falls on a Sunday, the day observed by the Nation shall be considered a holiday and compensated accordingly.
- W. Holidays: New Year's Day, Day After New Year's, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, Christmas Eve Day, Christmas Day, the day after Christmas, the day before New Year's Day, and a Floating Holiday.
- X. Holidays: New Year's Day, Day before or after New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, Christmas Day, and the day before or after Christmas day. If a holiday falls on a Saturday or on a Friday that is the normal day off, then the holiday will be taken on the last normal workday. If the holiday falls on a Monday that is the normal day off or on a Sunday, then the holiday will be taken on the next normal workday.
- Y. Holidays: New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, and Christmas Day. (8) If the holiday falls on a Sunday, then the day observed by the federal government shall be considered a holiday and compensated accordingly.
- Z. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday and Saturday after Thanksgiving Day, Christmas Eve, and Christmas Day (9). Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday. Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday.

Holiday Codes Continued

15. G. New Year's Day, Washington's Birthday, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, The Friday After Thanksgiving Day, the last scheduled workday before Christmas, and Christmas Day (9). If any of the listed holidays falls on a Sunday, the day observed by the Nation shall be considered a holiday and compensated accordingly.
- H. Holidays: New Year's Day, Martin Luther King Jr. Day, Independence Day, Memorial Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, the Last Working Day before Christmas Day and Christmas Day (9). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.
- I. Holidays: New Year's Day, President's Day, Independence Day, Memorial Day, Labor Day, Thanksgiving Day, The Friday After Thanksgiving Day, The Day Before Christmas Day And Christmas Day (9). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.
- J. Holidays: New Year's Day, Martin Luther King Jr. Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday and Saturday after Thanksgiving Day, and Christmas Day (9). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. If any of the listed holidays falls on a Saturday, the preceding Friday shall be a regular work day.
- K. Holidays: New Year's Day, Memorial Day, Independence Day, Thanksgiving Day, the Friday and Saturday after Thanksgiving Day, And Christmas Day (8). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.
- L. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, the Friday after Thanksgiving Day, and Christmas Day (8). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. If any of the listed holidays falls on a Saturday, the preceding Friday shall be a regular work day.
- M. Holidays: New Year's Day, Martin Luther King Jr. Day, Independence Day, Memorial Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, Christmas Eve Day and Christmas Day (9). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. If any of the listed holidays falls on a Saturday, the preceding Friday shall be a regular work day.
- N. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, the Friday after Thanksgiving Day, and Christmas Day (8). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday.

Note Codes

8. D. Workers working with supplied air on hazmat projects receive an additional \$1.00 per hour.
- L. Workers on hazmat projects receive additional hourly premiums as follows -Level A: \$0.75, Level B: \$0.50, And Level C: \$0.25.
- M. Workers on hazmat projects receive additional hourly premiums as follows: Levels A & B: \$1.00, Levels C & D: \$0.50.
- N. Workers on hazmat projects receive additional hourly premiums as follows -Level A: \$1.00, Level B: \$0.75, Level C: \$0.50, And Level D: \$0.25.

Note Codes Continued

8. S. Effective August 31, 2012 – A Traffic Control Supervisor shall be present on the project whenever flagging or spotting or other traffic control labor is being utilized. Flaggers and Spotters shall be posted where shown on approved Traffic Control Plans or where directed by the Engineer. All flaggers and spotters shall possess a current flagging card issued by the State of Washington, Oregon, Montana, or Idaho. This classification is only effective on or after August 31, 2012.
- T. Effective August 31, 2012 – A Traffic Control Laborer performs the setup, maintenance and removal of all temporary traffic control devices and construction signs necessary to control vehicular, bicycle, and pedestrian traffic during construction operations. Flaggers and Spotters shall be posted where shown on approved Traffic Control Plans or where directed by the Engineer. All flaggers and spotters shall possess a current flagging card issued by the State of Washington, Oregon, Montana, or Idaho. This classification is only effective on or after August 31, 2012.
- U. Workers on hazmat projects receive additional hourly premiums as follows – Class A Suit: \$2.00, Class B Suit: \$1.50, And Class C Suit: \$1.00. Workers performing underground work receive an additional \$0.40 per hour for any and all work performed underground, including operating, servicing and repairing of equipment. The premium for underground work shall be paid for the entire shift worked. Workers who work suspended by a rope or cable receive an additional \$0.50 per hour. The premium for work suspended shall be paid for the entire shift worked. Workers who do “pioneer” work (break open a cut, build road, etc.) more than one hundred fifty (150) feet above grade elevation receive an additional \$0.50 per hour.
- V. In addition to the hourly wage and fringe benefits, the following depth and enclosure premiums shall be paid. The premiums are to be calculated for the maximum depth and distance into an enclosure that a diver reaches in a day. The premiums are to be paid one time for the day and are not used in calculating overtime pay.
- Depth premiums apply to depths of fifty feet or more. Over 50' to 100' - \$2.00 per foot for each foot over 50 feet. Over 101' to 150' - \$3.00 per foot for each foot over 101 feet. Over 151' to 220' - \$4.00 per foot for each foot over 220 feet. Over 221' - \$5.00 per foot for each foot over 221 feet.
- Enclosure premiums apply when divers enter enclosures (such as pipes or tunnels) where there is no vertical ascent and is measured by the distance travelled from the entrance. 25' to 300' - \$1.00 per foot from entrance. 300' to 600' - \$1.50 per foot beginning at 300'. Over 600' - \$2.00 per foot beginning at 600'.
- W. Meter Installers work on single phase 120/240V self-contained residential meters. The Lineman/Groundmen rates would apply to meters not fitting this description.
- X. Workers on hazmat projects receive additional hourly premiums as follows - Class A Suit: \$2.00, Class B Suit: \$1.50, Class C Suit: \$1.00, and Class D Suit: \$0.50. Special Shift Premium: Basic hourly rate plus \$2.00 per hour.
- When due to conditions beyond the control of the Employer or when an owner (not acting as the contractor), a government agency or the contract specifications requires that work can only be performed outside the normal 5 am to 6pm shift, then the special shift premium will be applied to the basic hourly rate. When an employee works on a special shift, they shall be paid a special shift premium for each hour worked unless they are in OT or Double-time status. (For example, the special shift premium does not waive the overtime requirements for work performed on Saturday or Sunday.)
- Y. Tide Work: When employees are called out between the hours of 6:00 p.m. and 6:00 a.m. to work on tide work (work located in the tide plane) all time worked shall be at one and one-half times the hourly rate of pay.
- Swinging Stage/Boatswains Chair: Employees working on a swinging state or boatswains chair or under conditions that require them to be tied off to allow their hands to be free shall receive seventy-five cents (\$0.75) per hour above the classification rate.

Note Codes Continued

8. Z. Workers working with supplied air on hazmat projects receive an additional \$1.00 per hour.

Special Shift Premium: Basic hourly rate plus \$2.00 per hour. When due to conditions beyond the control of the Employer or when an owner (not acting as a contractor), a government agency or the contract specifications require that more than (4) hours of a special shift can only be performed outside the normal 6 am to 6pm shift, then the special shift premium will be applied to the basic straight time for the entire shift. When an employee works on a special shift, they will be paid a special shift premium for each hour worked unless they are in overtime or double-time status. (For example, the special shift premium does not waive the overtime requirements for work performed on Saturday or Sunday.)

9. A. Workers working with supplied air on hazmat projects receive an additional \$1.00 per hour.

Special Shift Premium: Basic hourly rate plus \$2.00 per hour. When due to conditions beyond the control of the Employer or when an owner (not acting as the contractor), a government agency or the contract specifications require that more than four (4) hours of a special shift can only be performed outside the normal 6 am to 6pm shift, then the special shift premium will be applied to the basic straight time for the entire shift. When an employee works on a special shift, they shall be paid a special shift premium for each hour worked unless they are in overtime or double-time status. (For example, the special shift premium does not waive the overtime requirements for work performed on Saturday or Sunday.)

Certified Crane Operator Premium: Crane operators requiring certifications shall be paid \$0.50 per hour above their classification rate.

Boom Pay Premium: All cranes including tower shall be paid as follows based on boom length:

(A) – 130' to 199' – \$0.50 per hour over their classification rate.

(B) – 200' to 299' – \$0.80 per hour over their classification rate.

(C) – 300' and over – \$1.00 per hour over their classification rate.

- B. The highest pressure registered on the gauge for an accumulated time of more than fifteen (15) minutes during the shift shall be used in determining the scale paid.

Tide Work: When employees are called out between the hours of 6:00 p.m. and 6:00 a.m. to work on tide work (work located in the tide plane) all time worked shall be at one and one-half times the hourly rate of pay. Swinging Stage/Boatswains Chair: Employees working on a swinging stage or boatswains chair or under conditions that require them to be tied off to allow their hands to be free shall receive seventy-five cents (\$0.75) per hour above the classification rate.

- C. Tide Work: When employees are called out between the hours of 6:00 p.m. and 6:00 a.m. to work on tide work (work located in the tide plane) all time worked shall be at one and one-half times the hourly rate of pay. Swinging Stage/Boatswains Chair: Employees working on a swinging stage or boatswains chair or under conditions that require them to be tied off to allow their hands to be free shall receive seventy-five cents (\$0.75) per hour above the classification rate.

Effective August 31, 2012 – A Traffic Control Supervisor shall be present on the project whenever flagging or spotting or other traffic control labor is being utilized. A Traffic Control Laborer performs the setup, maintenance and removal of all temporary traffic control devices and construction signs necessary to control vehicular, bicycle, and pedestrian traffic during construction operations. Flaggers and Spotters shall be posted where shown on approved Traffic Control Plans or where directed by the Engineer. All flaggers and spotters shall possess a current flagging card issued by the State of Washington, Oregon, Montana, or Idaho. These classifications are only effective on or after August 31, 2012.

- D. Industrial Painter wages are required for painting within industrial facilities such as treatment plants, pipelines, towers, dams, bridges, power generation facilities and manufacturing facilities such as chemical plants, etc., or anywhere abrasive blasting is necessary to prepare surfaces, or hazardous materials encapsulation is required.

Note Codes Continued

- 9. E. Heavy Construction includes construction, repair, alteration or additions to the production, fabrication or manufacturing portions of industrial or manufacturing plants, hydroelectric or nuclear power plants and atomic reactor construction. Workers on hazmat projects receive additional hourly premiums as follows -Level A: \$1.00, Level B: \$0.75, Level C: \$0.50, And Level D: \$0.25.
- F. Industrial Painter wages are required for painting within industrial facilities such as treatment plants, pipelines, towers, dams, power generation facilities and manufacturing facilities such as chemical plants, etc., or anywhere abrasive blasting is necessary to prepare surfaces, or hazardous materials encapsulation is required.
- H. One (1) person crew shall consist of a Party Chief. (Total Station or similar one (1) person survey system). Two (2) person survey party shall consist of a least a Party Chief and a Chain Person. Three (3) person survey party shall consist of at least a Party Chief, an Instrument Person, and a Chain Person.

Applicability

The Project or Program to which the construction work covered by this contract pertains is being assisted by the United States of America and the following Federal Labor Standards Provisions are included in this Contract pursuant to the provisions applicable to such Federal assistance.

A. 1. (i) Minimum Wages. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section I(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR 5.5(a)(1)(iv); also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period.

Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under 29 CFR 5.5(a)(1)(ii) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible, place where it can be easily seen by the workers.

(ii) (a) Any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. HUD shall approve an additional classification and wage rate and fringe benefits therefor only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(b) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and HUD or its designee agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by HUD or its designee to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, D.C. 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB control number 1215-0140.)

(c) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and HUD or its designee do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), HUD or its designee shall refer the questions, including the views of all interested parties and the recommendation of HUD or its designee, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

(d) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (1)(ii)(b) or (c) of this paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part

of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

2. Withholding. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee or helper, employed or working on the site of the work, all or part of the wages required by the contract, HUD or its designee may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased. HUD or its designee may, after written notice to the contractor, disburse such amounts withheld for and on account of the contractor or subcontractor to the respective employees to whom they are due. The Comptroller General shall make such disbursements in the case of direct Davis-Bacon Act contracts.

3. (i) Payrolls and basic records. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in Section 1(b)(2)(B) of the Davis-bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5 (a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been

communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs. (Approved by the Office of Management and Budget under OMB Control Numbers 1215-0140 and 1215-0017.)

(ii) (a) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant sponsor, or owner, as the case may be, for transmission to HUD or its designee. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i) except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant sponsor, or owner, as the case may be, for transmission to HUD or its designee, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this subparagraph for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to HUD or its designee. (Approved by the Office of Management and Budget under OMB Control Number 1215-0149.)

(b) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under 29 CFR 5.5 (a)(3)(ii), the appropriate information is being maintained under 29 CFR 5.5(a)(3)(i), and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR Part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(c) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by subparagraph A.3.(ii)(b).

(d) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under subparagraph A.3.(i) available for inspection, copying, or transcription by authorized representatives of HUD or its designee or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, HUD or its designee may, after written notice to the contractor, sponsor, applicant or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and Trainees.

(i) **Apprentices.** Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who

is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) **Trainees.** Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by

the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under 29 CFR Part 5 shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR Part 3 which are incorporated by reference in this contract

6. Subcontracts. The contractor or subcontractor will insert in any subcontracts the clauses contained in subparagraphs 1 through 11 in this paragraph A and such other clauses as HUD or its designee may by appropriate instructions require, and a copy of the applicable prevailing wage decision, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in this paragraph.

7. Contract termination; debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act Requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and HUD or its designee, the U.S. Department of Labor, or the employees or their representatives.

10. (i) Certification of Eligibility. By entering into this contract the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be

awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001. Additionally, U.S. Criminal Code, Section 1 01 0, Title 18, U.S.C., "Federal Housing Administration transactions", provides in part: "Whoever, for the purpose of . . . influencing in any way the action of such Administration..... makes, utters or publishes any statement knowing the same to be false..... shall be fined not more than \$5,000 or imprisoned not more than two years, or both."

11. Complaints, Proceedings, or Testimony by Employees. No laborer or mechanic to whom the wage, salary, or other labor standards provisions of this Contract are applicable shall be discharged or in any other manner discriminated against by the Contractor or any subcontractor because such employee has filed any complaint or instituted or caused to be instituted any proceeding or has testified or is about to testify in any proceeding under or relating to the labor standards applicable under this Contract to his employer.

B. Contract Work Hours and Safety Standards Act. The provisions of this paragraph B are applicable where the amount of the prime contract exceeds \$100,000. As used in this paragraph, the terms "laborers" and "mechanics" include watchmen and guards.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which the individual is employed on such work to work in excess of 40 hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of 40 hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in subparagraph (1) of this paragraph, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in subparagraph (1) of this paragraph, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of 40 hours without payment of the overtime wages required by the clause set forth in subparagraph (1) of this paragraph.

(3) Withholding for unpaid wages and liquidated damages. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contract, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act which is held by the same prime contractor such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in subparagraph (2) of this paragraph.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in subparagraph (1) through (4) of this paragraph and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in subparagraphs (1) through (4) of this paragraph.

C. Health and Safety. The provisions of this paragraph C are applicable where the amount of the prime contract exceeds \$100,000.

(1) No laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health and safety as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation.

(2) The Contractor shall comply with all regulations issued by the Secretary of Labor pursuant to Title 29 Part 1926 and failure to comply may result in imposition of sanctions pursuant to the Contract Work Hours and Safety Standards Act, (Public Law 91-54, 83 Stat 96). 40 USC 3701 et seq.

(3) The contractor shall include the provisions of this paragraph in every subcontract so that such provisions will be binding on each subcontractor. The contractor shall take such action with respect to any subcontractor as the Secretary of Housing and Urban Development or the Secretary of Labor shall direct as a means of enforcing such provisions.

"General Decision Number: WA20230012 09/29/2023

Superseded General Decision Number: WA20220012

State: Washington

Construction Type: Building

County: Kitsap County in Washington.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60).

<p>If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:</p>	<ul style="list-style-type: none"> . Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least \$16.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2023.
<p>If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:</p>	<ul style="list-style-type: none"> . Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least \$12.15 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2023.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <http://www.dol.gov/whd/govcontracts>.

Modification Number	Publication Date
0	01/06/2023
1	01/13/2023

2	02/03/2023
3	08/25/2023
4	09/29/2023

* ASBE0007-002 06/01/2023

	Rates	Fringes
ASBESTOS WORKER/HEAT & FROST INSULATOR.....	\$ 66.37	20.59

BRWA0001-010 06/01/2021

	Rates	Fringes
BRICKLAYER.....	\$ 46.14	17.18

CARP0030-009 06/01/2021

	Rates	Fringes
CARPENTER (Including Cabinet Installation, Drywall Hanging, Form Work and Metal Stud Installation).....	\$ 49.18	19.01
PILEDRIVERMAN.....	\$ 49.58	19.01

(HOURLY ZONE PAY: WESTERN AND CENTRAL WASHINGTON - ALL CLASSIFICATIONS EXCEPT MILLWRIGHTS AND PILEDRIVERS

Hourly Zone Pay shall be paid on jobs located outside of the free zone computed from the city center of the following listed cities:

- | | | |
|------------------|--------------|--------------|
| Seattle | Olympia | Bellingham |
| Auburn | Bremerton | Anacortes |
| Renton | Shelton | Yakima |
| Aberdeen-Hoquiam | Tacoma | Wenatchee |
| Ellensburg | Everett | Port Angeles |
| Centralia | Mount Vernon | Sunnyside |
| Chelan | Pt. Townsend | |

Zone Pay:

0 -25 radius miles	Free
26-35 radius miles	\$1.00/hour
36-45 radius miles	\$1.15/hour
46-55 radius miles	\$1.35/hour
Over 55 radius miles	\$1.55/hour

(HOURLY ZONE PAY: WESTERN AND CENTRAL WASHINGTON - MILLWRIGHT AND PILEDRIVER ONLY)

Hourly Zone Pay shall be computed from Seattle Union Hall, Tacoma City center, and Everett City center

Zone Pay:

0 -25 radius miles	Free
26-45 radius miles	\$.70/hour
Over 45 radius miles	\$1.50/hour

ELEC0046-006 08/07/2023

Rates	Fringes
-------	---------

ELECTRICIAN.....\$ 69.99 28.39

 ENGI0302-021 06/01/2022

Rates Fringes

Power equipment operators:

Group 1A.....	\$ 54.20	24.47
Group 1AA.....	\$ 54.98	24.47
Group 1AAA.....	\$ 55.78	24.47
Group 1.....	\$ 53.40	24.47
Group 2.....	\$ 52.72	24.47
Group 3.....	\$ 52.12	24.47
Group 4.....	\$ 48.78	24.47

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1AAA - Cranes-over 300 tons, or 300 ft of boom
 (including jib with attachments)

GROUP 1AA - Cranes 200 to 300 tons, or 250 ft of boom
 (including jib with attachments); Excavator/Trackhoe: Over
 90 metric tons

GROUP 1A - Cranes, 100 tons thru 199 tons, or 150 ft of boom
 (including jib with attachments); Excavator/Trackhoe: over
 50 metric tons to 90 metric tons

GROUP 1 - Cranes 45 tons thru 99 tons, under 150 ft of boom
 (including jib with attachments); Excavator/Trackhoe: over
 30 metric tons to 50 metric tons; Dozer D-10; Screedman;
 Scrapers: 45 yards and over; Grader/Blade

GROUP 2 - Cranes, 20 tons thru 44 tons with attachments;
 Drilling machine; Excavator/Trackhoe: 15 to 30 metric tons;
 Horizontal/directional drill operator; Crane Oiler-100 Tons
 and Over; Compactor; Scraper: under 45 tons

GROUP 3 - Cranes-thru 19 tons with attachments; Dozers-D-9
 and under; Motor patrol grader-nonfinishing; Roller-Plant
 Mix; Crane Oiler under 100 tons; Excavator/Trackhoe: under
 15 metric tons; Forklift: 3000 lbs and over with
 attachments; Service Oiler; Concrete Pump;

GROUP 4 - Roller-other than plant mix; Forklift: under 3000
 lbs with attachments; Bobcat

 IRON0086-010 01/02/2023

Rates Fringes

IRONWORKER (Reinforcing,
 Structural and Ornamental).....\$ 50.90 32.57

 LAB00252-006 06/01/2022

ZONE 1:

Rates Fringes

Laborers:

GROUP 2.....	\$ 34.20	13.80
GROUP 3.....	\$ 42.86	13.80
GROUP 4.....	\$ 43.90	13.80

GROUP 5.....\$ 44.62 13.80

ZONE DIFFERENTIAL (ADD TO ZONE 1 RATES):

ZONE 2 - \$1.00

ZONE 3 - \$1.30

BASE POINTS: BELLINGHAM, MT. VERNON, EVERETT, SEATTLE, KENT, TACOMA, OLYMPIA, CENTRALIA, ABERDEEN, SHELTON, PT. TOWNSEND, PT. ANGELES, AND BREMERTON

ZONE 1 - Projects within 25 radius miles of the respective city hall

ZONE 2 - More than 25 but less than 45 radius miles from the respective city hall

ZONE 3 - More than 45 radius miles from the respective city hall

LABORERS CLASSIFICATIONS

GROUP 2: Flagman; Fence Erector

GROUP 3: General Laborer; Chipping Gun (under 30 lbs.); Form Stripping;

GROUP 4: Chipping Gun (over 30 lbs.); Concrete Saw Operator; Gunite; Pipe Layer; Vibrating Plate

GROUP 5: Mason Tender-Brick; Mason Tender-Cement/Concrete; Grade Checker; ; Asphalt Raker

----- PAIN0005-029 07/01/2022

	Rates	Fringes
DRYWALL FINISHER/TAPER.....	\$ 48.46	21.73

----- PAIN0005-033 07/01/2022

	Rates	Fringes
PAINTER (Excluding Roller and Spray).....	\$ 35.95	13.23

----- PAIN0188-005 07/01/2022

	Rates	Fringes
GLAZIER.....	\$ 54.45	21.20

----- PAIN1238-002 07/01/2022

	Rates	Fringes
SOFT FLOOR LAYER (Including Vinyl and Carpet).....	\$ 36.53	18.78

----- * PLUM0026-016 06/01/2023

	Rates	Fringes
Plumbers and Pipefitters.....	\$ 54.47	30.90

----- ROOF0054-009 06/01/2023

	Rates	Fringes
ROOFER (Includes Roof Tear Off, Waterproofing, and Installation of Metal Roofs).....	\$ 44.50	16.45

SFWA0699-002 01/01/2023

	Rates	Fringes
SPRINKLER FITTER (Fire Sprinklers).....	\$ 60.94	31.05

SHEE0066-024 06/01/2022

	Rates	Fringes
Sheet Metal Worker (Including HVAC Duct Installation).....	\$ 61.55	30.05

* SUWA2009-025 05/22/2009

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER...	\$ 19.54	3.17
LABORER: Handheld Drill.....	\$ 17.17	5.36
LABORER: Irrigation.....	\$ 11.58 **	0.00
LABORER: Landscape.....	\$ 9.90 **	0.00
OPERATOR: Backhoe.....	\$ 26.45	7.47
OPERATOR: Loader.....	\$ 26.62	7.88
OPERATOR: Mechanic.....	\$ 24.33	4.33
PAINTER: Roller.....	\$ 25.40	0.00
PAINTER: Spray.....	\$ 25.40	0.00
TILE SETTER.....	\$ 18.38	2.90
TRUCK DRIVER: Dump Truck.....	\$ 26.70	9.85
TRUCK DRIVER: Semi-Trailer Truck.....	\$ 19.80	1.27

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

=====
** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 (\$16.20) or 13658 (\$12.15). Please see the Note at the top of the wage determination for more information.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide

employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007

in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

=====

END OF GENERAL DECISION"



September 6, 2023

NL Olson and Associates
Attn: Trish Walton
PO Box 637
Port Orchard, WA 98366

RE: Binding Water/Sewer Availability

Dear Ms. Walton:

This is to acknowledge receipt of your inquiry relative to obtaining non-binding letters of availability for water and sewer services from West Sound Utility District for Kitsap County Tax Parcel # 302402-4-144-2009 located at 4459 SE Mile Hill Drive, Port Orchard, WA 98366.

Relative to water service, the District is already bound to the subject property for water with an existing 1" water service. The water service to the property can be increased to a 2" service as per your inquiry. This would require a cost to the property owner for the upsized meter cost with a credit applied for the existing meter size. The existing service line and main tap will need to be sized to accommodate the increased meter size on a time and materials basis. The district will provide a cost estimate if you desire to move forward. Additionally, the increased meter size will require the building water line to be modified and reconnected by the owner to accommodate the increased meter size.

Relative to sewer service, the District is already bound to the subject property with an existing sewer service for twelve (12) equivalent residential units. You have indicated an expansion need of an additional twenty-six (26) equivalent residential units which can be accommodated. As the property is on a pump system, a capacity analysis of the storage and pump system will need to be completed to ensure adequacy and a copy of the capacity analysis provided to the district for review.

If you have any questions, or we can be of further assistance, please contact Customer Service at 360-876-2545.

Sincerely,

A handwritten signature in black ink, appearing to read "G. Screws", written in a cursive style.

Glen R. Screws
General Manager





WATER SUPPLY ANALYSIS

SITE INFORMATION

Address 4459 SE Mile Hill Drive
Location Port Orchard, WA 98366
Date 4/11/2023
Time 9:00am
Performed By Fireshield Inc.

PRESSURE HYDRANT

Location Corner of SE Mile Hill Drive, Village Lane SE
Static Pressure 47 psi
Residual Pressure 41 psi

FLOW HYDRANT

Location 4459 SE Mile Hill Drive
Pitot Pressure 13 psi
Number of Outlets 2 outlets
Outlet Diameter 2.5 inch
Outlet Coefficient 0.9
Total Flow 1210 gpm

EMERGENCY RESPONSE

Pressure at Fire Flow 20 psi
Expected Flow at 20 psi 2,727 gpm

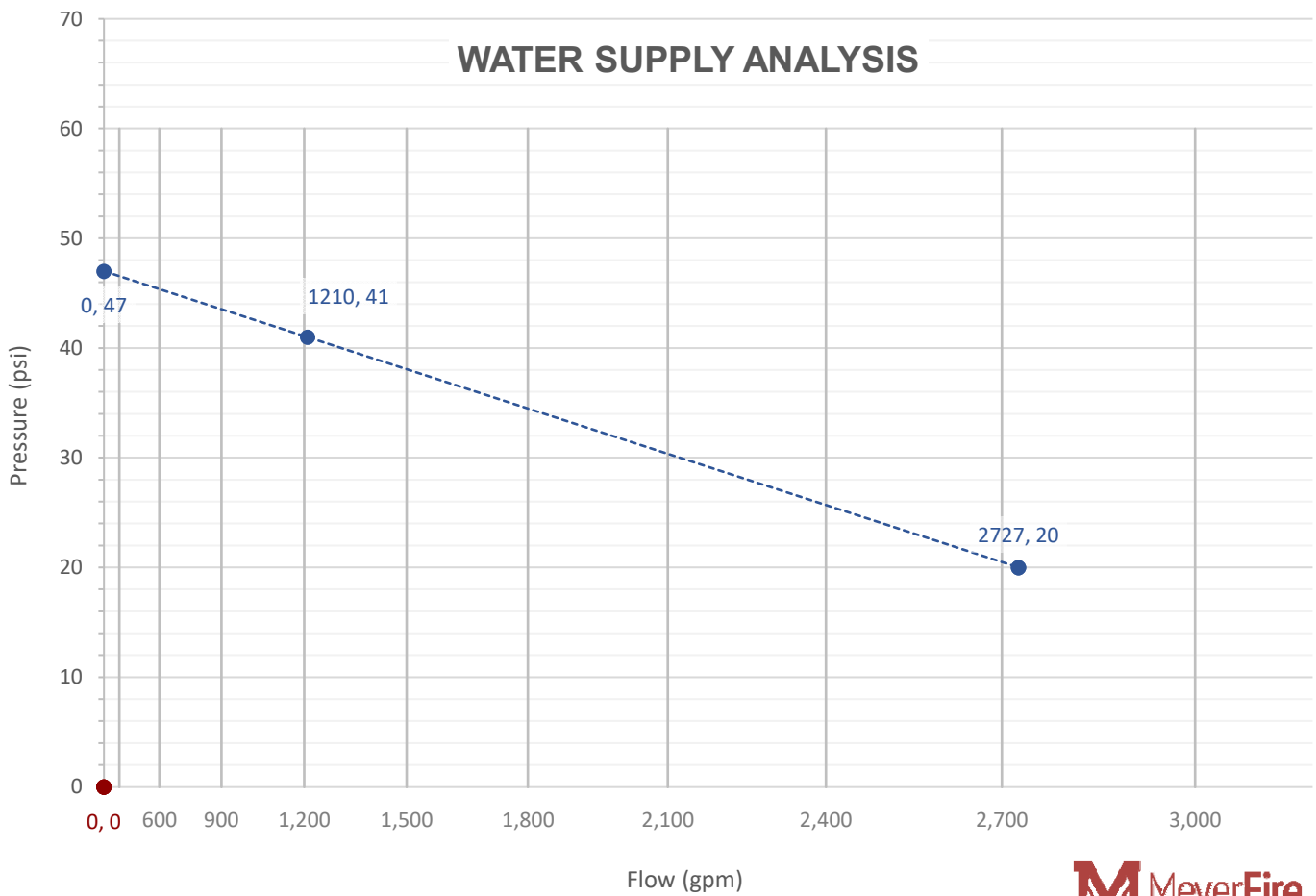
SYSTEM INFORMATION

System Demand psi
System Flow gpm
Hose Included gpm

SAFETY MARGIN

Available Pressure at Demand Point - psi
Safety Provided - psi

WATER SUPPLY ANALYSIS





FIRESHIELD

Phone: (253) 851-0030 Fax: (253) 851-9782

P.O. BOX 2389 Gig Harbor, WA 98335

www.fireshieldinc.com

WATER FLOW TEST REPORT

SITE INFORMATION

Address 4459 SE Mile Hill Drive
Location Port Orchard, WA 98366
Date 4/11/2023
Time 9:00am
Performed By Fireshield Inc.

PRESSURE HYDRANT

Location Corner of SE Mile Hill Drive, Village Lane SE
Static Pressure 47 psi
Residual Pressure 41 psi

FLOW HYDRANT

Location 4459 SE Mile Hill Drive
Pitot Pressure 13 psi
Number of Outlets 2 outlets
Outlet Diameter 2.5 inch
Outlet Coefficient 0.9
Total Flow 1210 gpm

EMERGENCY RESPONSE

Pressure at Fire Flow 20 psi
Expected Flow at 20 psi 2727 gpm



PACIFIC BUILDING CONVERSION
TRAFFIC IMPACT ANALYSIS

Kitsap County, WA



07/15/2022

Prepared for: Mr. Greg Belding
Principal
275 Fifth Street, Suite 100
Bremerton, WA 98337

July 2022

PACIFIC BUILDING CONVERSION
TRAFFIC IMPACT ANALYSIS

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PACIFIC BUILDING CONVERSION TRAFFIC IMPACT ANALYSIS

1. INTRODUCTION

The main goals of this study focus on the analysis of existing roadway conditions and forecasts of newly generated project traffic. The first task includes the review of general roadway information on the adjacent street system, baseline vehicular volumes, and entering sight distance data. Forecasts of future traffic and dispersion patterns on the street system are then determined using established trip generation and distribution techniques. As a final step, appropriate conclusions and mitigation measures are defined.

2. PROJECT DESCRIPTION

Pacific Building Conversion proposes for the development of a low-barrier shelter located within the city of Port Orchard's Urban Growth Area of Kitsap County. A low-barrier shelter currently operates out of 4303 Kitsap Way, occupying several buildings of a Quality Inn. The existing shelter serves South Kitsap and comprises 75 guests. The development proposal entails relocating the existing shelter to a new site, Pacific Building Conversion, located at 4459 SE Mile Hill Drive. The development proposal includes retrofitting an existing ~20,000 square foot health and fitness facility on-site to accommodate the proposed shelter's operational demands. The low-barrier site will operate similarly to that of the existing shelter at 4303 Kitsap Way. The shelter is anticipated to house approximately 75 guests on-site and will provide them with services such as meals, laundry, personal hygiene and storage for personal possessions. Kitsap Rescue Mission staff, additional employees, service providers and volunteers will also frequent the subject site.

The proposed 4459 SE Mile Hill Drive subject site comprises 2.75-acre tax parcel #: 302402-4-144-2009, bordered to the south by SE Mile Hill Drive. Access to and from the Pacific Building Conversion project is proposed to continue via one shared driveway extending north from SE Mile Hill Drive, situated along the eastern border of the subject parcel. Figure 1.1 on the following page illustrates the locations of the existing Quality Inn low-barrier shelter in relation to the proposed Pacific Building Conversion project. Figure 1.2 depicts the proposed subject site's vicinity and surrounding roadway network. Lastly, a conceptual site plan is provided in Figure 2, which outlines the proposed access location.

Figure 1.1: Existing & Proposed Facility Locations

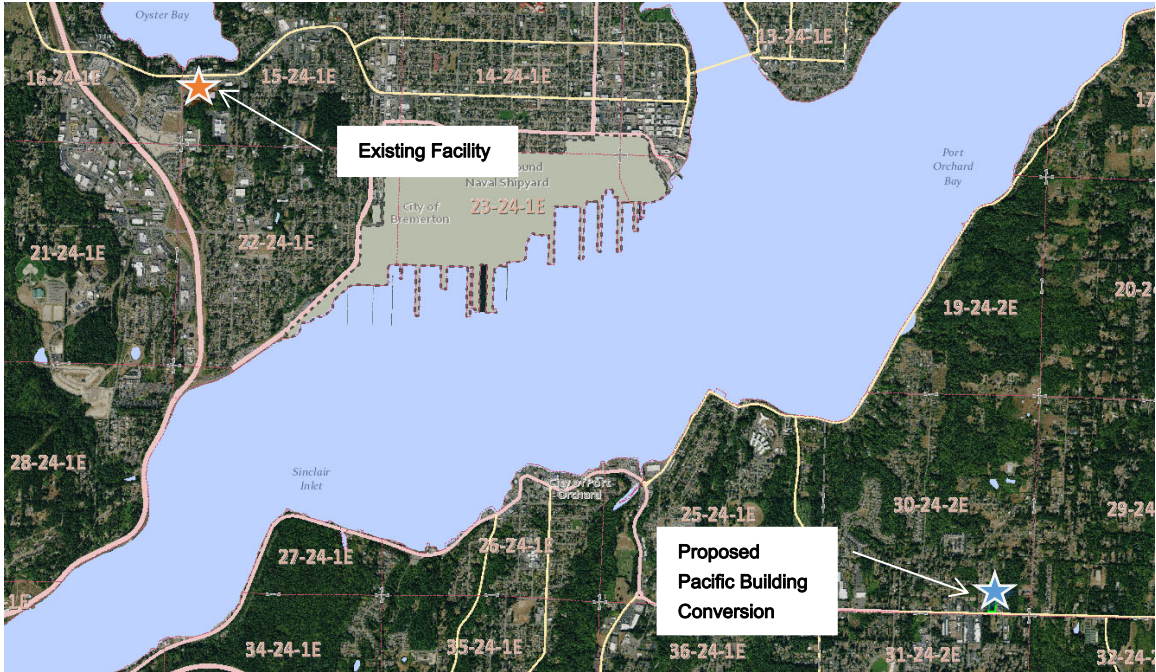
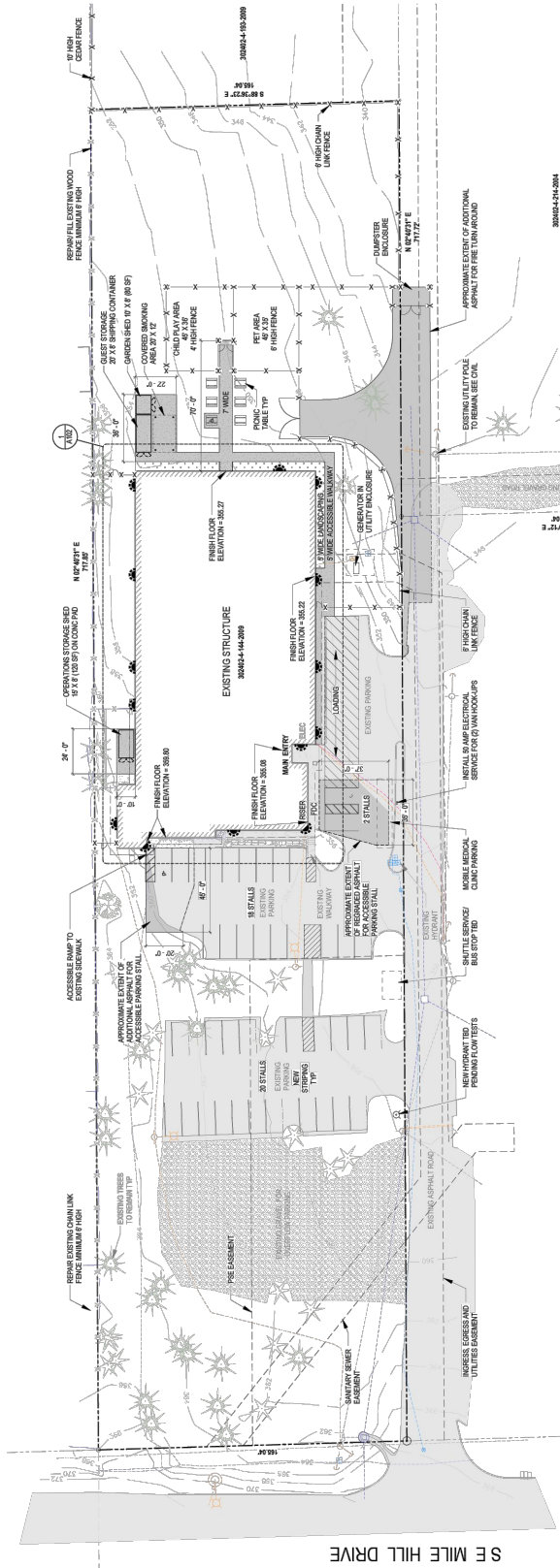


Figure 1.2: Aerial Vicinity Map





HEATH & ASSOCIATES
TRAFFIC AND CIVIL ENGINEERING

PACIFIC BUILDING CONVERSION

SITE PLAN
FIGURE 2

3. EXISTING CONDITIONS

3.1 Existing Street System

The primary roadway serving the subject site is *SE Mile Hill Drive*, a 2- to 4-lane, east west, minor arterial, bordering the subject site to the south. Travel lanes are approximately 11- to 12-feet in width. The roadway cross-section along the project frontage consists of one travel lane in either direction and a center two-way left-turn lane. Paved/gravel shoulders varying in width are provided along either side of the roadway in the vicinity of the subject site. Discontinuous sidewalks are available along the north side of the roadway. The posted speed limit in the subject site's vicinity is 35 mph.

3.2 Public Transit

A review of the Kitsap Transit regional bus schedule indicates that transit service is provided within walking distance of the subject site. The nearest bus stops are located ~400 feet west of the subject site at the study intersection of SE Mile Hill Drive & Village Lane SE, serving Route 86 – Southworth Shuttle. Route 86 – Southworth Shuttle provides service from the Port Orchard Ferry to the Southworth Ferry Terminal. Weekday service is provided from 4:35 AM - 8:18 PM with approximately 60-minute headways during peak travel times. Saturday service is provided from 9:05 AM - 8:06 PM with approximately 70-minute headways during peak travel times. No Sunday service is provided.

Routes 9 and 81 additionally provide service within walking distance of the subject site. The nearest stops servicing these routes are provided approximately 0.9-miles northwest of the proposed development, north of Olney Street SE & SE Mile Hill Drive. Route 9 – South Park provides service from The Port Orchard Ferry to the intersection of Jackson Avenue SE & Salmonberry Road. Weekday service is provided from 6:50 AM - 7:20 PM with approximately 60-minute headways during peak travel times. Saturday service is provided from 10:30 AM - 5:15 PM with approximately 60-minute headways during peak travel times. No Sunday service is provided. No Sunday service is provided.

81 – Annapolis Commuter provides service from the Annapolis Ferry Dock to SE Mile Hill Drive. Weekday morning service is provided from 5:05 AM - 7:15 AM with approximately 15-minute headways during peak travel times. Afternoon to evening weekday service is provided from 3:00 PM - 5:42 PM with approximately 15-minute headways. No weekend service is provided. Refer to the Kitsap Transit website for more detailed information.

It is anticipated that a significant portion of future project residents will utilize public transportation opportunities in the vicinity of the subject site. Moreover, two shuttle vans would be provided on-site providing additional transportation opportunities to project residents. Said shuttle services would offer guests the opportunity to perform errands and other necessary personal trips.

3.3 Roadway Improvements

A review of the Kitsap County Six-Year (2022-2027) Transportation Improvement Program, Port Orchard Six-Year (2022-2027) Transportation Improvement Program and Washington State Statewide Transportation Improvement Program (2022-2025) indicates that the following project is planned in the immediate site vicinity.

Washington State Statewide Transportation Improvement Program (2022-2025)

SR 166/Port Orchard - Rebuild Signals (SR MP 4.15 to 4.79): This project entails replacing obsolete signal systems using current technology and standards. The total estimated cost is \$2,441,024 and construction is anticipated to occur in 2023.

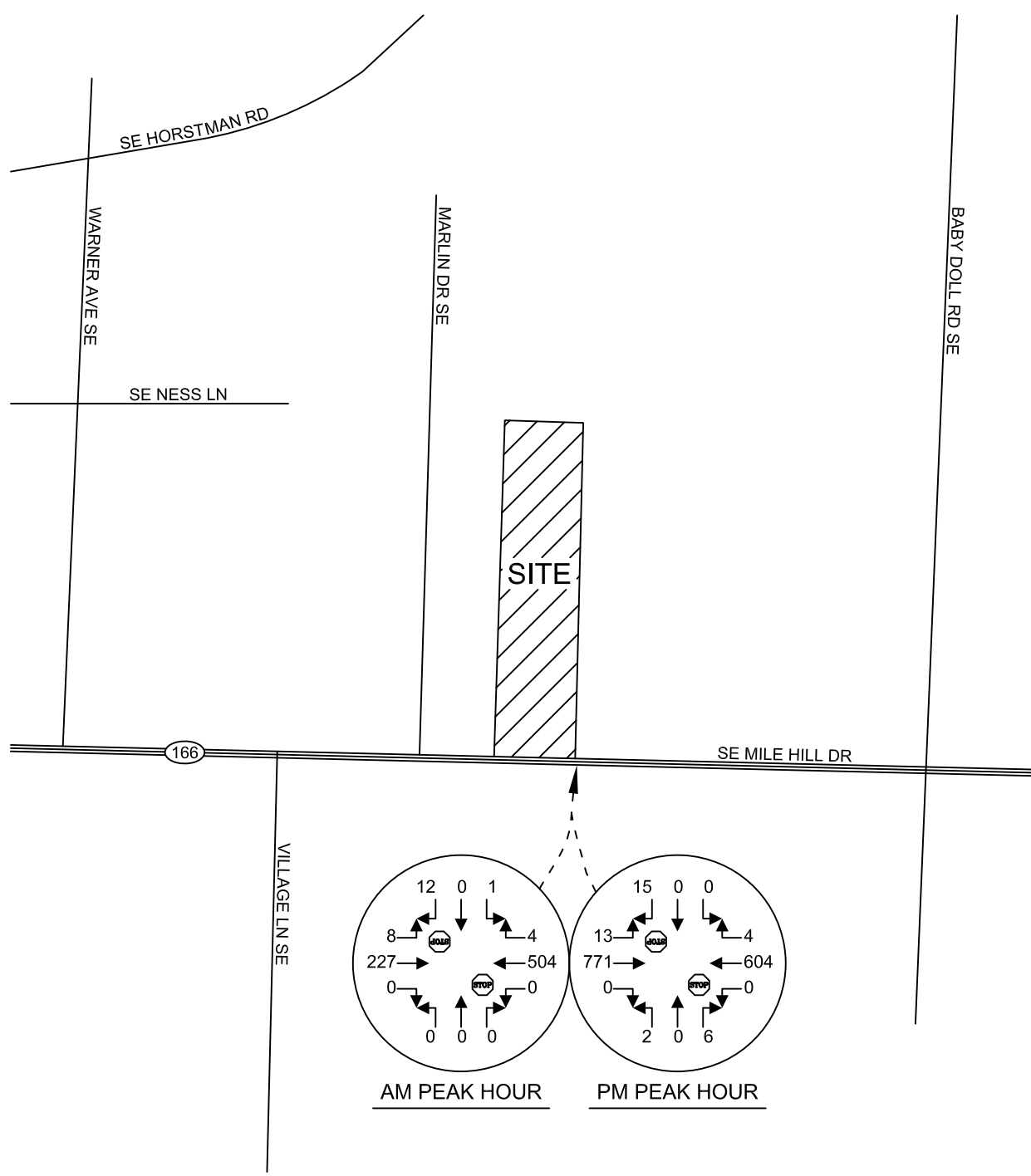
3.4 Existing Peak Hour Volumes and Patterns

Field data for this study was collected in June of 2022. Traffic counts were administered at the existing driveway currently serving the subject site, which extends north from SE Mile Hill Drive. The driveway additionally serves the parcel neighboring the proposed development to the east. Data was obtained during the morning and evening peak hour timeframes of 7:00 – 9:00 AM and 4:00 – 6:00 PM, which generally translates to the highest overall roadway volumes in a given 24-hour period. The one hour reflecting highest overall roadway volumes from each timeframe was then derived from the counts. Existing AM and PM peak hour volumes are illustrated in Figure 3 on the following page. Full count sheets are listed in the appendix for reference.

It should be noted that the existing fitness center on-site was closed at the time of field counts. As such, existing peak hour volumes capture movements associated with the easterly parcel that is proposed to share access with the Pacific Building Conversion facility.

3.5 Pedestrian and Bicycle Activity

Non-motorist infrastructure in the vicinity of the subject site is generally discontinuous. During field observations, minimal non-motorist transport was observed along the project frontage on SE Mile Hill Drive. During the AM peak hour, 1 pedestrian and no bicyclists were noted traversing across the north leg of the access intersection of SE Mile Hill Drive. During the PM peak hour, 4 pedestrians and no bicyclists were noted.



HEATH & ASSOCIATES
TRAFFIC AND CIVIL ENGINEERING

PACIFIC BUILDING CONVERSION
EXISTING WEEKDAY PEAK HOUR VOLUMES
FIGURE 3

3.6 Level of Service

Existing intersection delays were determined through the use of the *Highway Capacity Manual* 6th Edition. Capacity analysis is used to determine level of service (LOS) which is an established measure of congestion for transportation facilities. The range¹ for intersection level of service is LOS A to LOS F with the former indicating the best operating conditions with low control delays and the latter indicating the worst conditions with heavy control delays. Detailed descriptions of intersection LOS are given in the 2016 Highway Capacity Manual. Level of service calculations were made through the use of the *Synchro 11* analysis program. For side-street stop-controlled intersections, LOS is determined by the approach with the highest delay. Table 1 below presents existing weekday peak hour LOS delays for the proposed development's shared access on SE Mile Hill Drive.

Table 1: Existing Weekday Peak Hour Level of Service

Delays given in seconds per vehicle

Intersection	Control	Peak Hour	Movement	LOS	Delay
SE Mile Hill Dr & Shared Access	Stop	AM PM	SB NB	B C	12.7 16.3

Existing weekday peak hour delays are shown to operate with LOS C or better conditions for the shared access on SE Mile Hill Drive.

3.7 Site Access & Roadway Design

Access to and from the Pacific Building Conversion project is proposed via one existing, shared driveway extending north from AE Mile Hill Drive. In accordance with established AASHTO standards, approximately 415 feet of unobstructed view is needed for vehicles to enter SE Mile Hill Drive based on the posted 35-mph speed limit and the roadway configuration (two-way left-turn lane). Based on preliminary measurements at the existing access location on SE Mile Hill Drive, sight lines are clear in excess of 500 feet looking both east and west. No sight line deficiencies are identified as a result of the development proposal.

¹ *Signalized Intersections - Level of Service*

Level of Service	Control Delay per Vehicle (sec)
A	≤ 10
B	> 10 and ≤ 20
C	> 20 and ≤ 35
D	> 35 and ≤ 55
E	> 55 and ≤ 80
F	> 80

Highway Capacity Manual, 6th Edition

Stop Controlled Intersections – Level of Service

Level of Service	Control Delay per Vehicle (sec)
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

4. FUTURE TRAFFIC CONDITIONS

4.1 Trip Generation

Trip generation is typically derived using the Institute of Transportation Engineering Manual, Trip Generation Manual. However, no applicable Land Use Code (LUC) in the 11th Edition manual was identified as representative for a low-barrier shelter. A site-specific trip generation analysis was therefore performed to provide a more accurate forecast for the Pacific Building Conversion facility. As previously noted, the current 4303 Kitsap Way shelter is to be relocated to the proposed Pacific Building Conversion site. Operational characteristics associated with the new site are to remain relatively similar to that of the existing 4303 Kitsap Way site. Therefore, sample site observations made at the 4303 Kitsap Way low-barrier facility were used to establish trip generation for the proposed Pacific Building Conversion project. Data was received from the Kitsap Rescue Mission (KRM), which accounts for the 75-guest shelter comprising KRM staff, additional employees, service providers, volunteers and other miscellaneous trips. A spreadsheet detailing the existing site's trip generation observations and personnel records has been attached in the appendix for reference.

Based on existing 4303 Kitsap Way site characteristics, approximately 10 staff are anticipated during the weekday day shift (8:00 AM – 4:30 PM), 5 staff during the swing shift (4:00 PM – 12:30 AM) and 2 staff during the graveyard shift (12:00 AM – 8:30 AM). Moreover, an additional 4 Kitsap Rescue Mission staff and 2 service providers will be on-site during all weekday shifts. Additional estimations for residents, visitors and other site trip generation associated with each shift is provided in the attached spreadsheet. Past experience indicates that visitors to the site would be infrequent and would not likely occur during the peak hours of study.

To provide a conservative trip generation analysis, it was assumed that shift changes may occur during the peak hours of study, resulting in overlaps of KRM employees, staff and service providers on-site. For example, personnel working the graveyard shift would be departing the site during the AM peak hour while day shift personnel would be arriving on-site. Moreover, it was assumed that approximately 10% of all remaining day shift and swing shift trips (i.e.: volunteers; residents; others) would occur during the AM and PM peak hours respectively. A breakdown of AM and PM peak hour trip generation associated with the development proposal is outlined on the following page.

AM Peak Hour Trip Generation

- Graveyard shift personnel departing: 8 outbound trips
- Day shift personnel arriving: 16 inbound trips
- 10% of day shift trips: 3 inbound / 3 outbound
- **Total AM peak hour trips: 30 (19 inbound / 11 outbound)**

PM Peak Hour Trip Generation

- Day shift personnel departing: 16 outbound trips
- Swing shift personnel arriving: 11 inbound trips
- 10% of day shift trips: 3 inbound / 3 outbound
- **Total PM peak hour trips: 33 (14 inbound / 19 outbound)**

Given the above outlined trip generation estimations, approximately 30 AM peak hour trips (19 inbound / 11 outbound) and 33 PM peak hour (14 inbound / 19 outbound) are anticipated as a result of the development proposal.

While the on-site building was observed to be primarily inactive, Kitsap County Assessor data shows the former gym structure to contain 20,040 square feet. The corresponding ITE Land Use Code (LUC) for this use is Health/Fitness Club (LUC 492). Square footage was used as the input variable for the former land use and ITE average rates were used to determine trip ends. A summary of former, proposed, and net new trip generation estimates based on the previously outlined information is provided below in Table 2. Vehicular movements are provided for the average weekday daily trips (AWDT), AM peak hour and PM peak hour. ITE Trip Generation sheets have been attached to the appendix for reference.

Table 2: Project Trip Generation

Land Use	Units	AWDT	AM Peak-Hour Trips			PM Peak-Hour Trips		
			In	Out	Total	In	Out	Total
<u>Former:</u> Health/Fitness Club	~20,000 sq. ft.	-690²	-13	-13	-26	-39	-30	-69
<u>Proposed:</u> Pacific Bldg. Conversion	75 guests	178	19	11	30	14	19	33
Net New Trips		-512	6	-2	4	-25	-11	-36

² ADT volumes were derived via the common engineering practice of multiplying PM peak hour trip generation by 10.

Based on operational data from the existing 4303 Kitsap Way facility, the project is anticipated to generate 30 trips (19 inbound / 11 outbound) occurring in the AM peak hour and 33 trips (25 inbound / 11 outbound) occurring in the PM peak hour. Moreover, it should be noted that average daily weekday trip generation is anticipated to be significantly lower than the former gym land use occupying the subject site. Average daily trip generation was derived by taking the average of all individuals recorded during all three shifts (89 total individuals) and multiplying that number by 2 to account for inbound and outbound site movements.

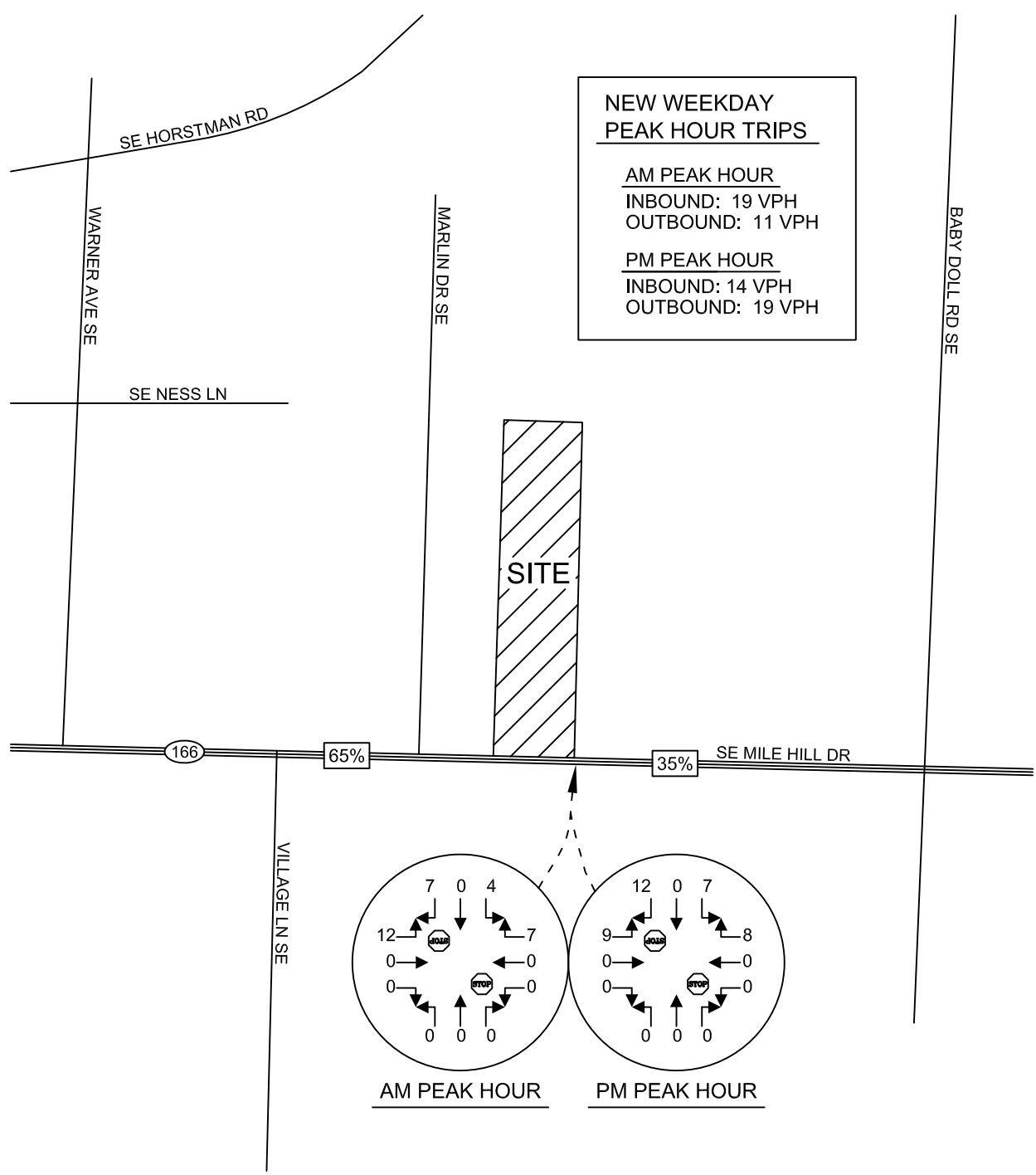
4.2 Trip Distribution and Assignment

Trip distribution describes the process by which project generated trips are dispersed on the street network surrounding the site. Weekday peak hour trips generated by the project are expected to follow the general trip pattern as shown in Figure 4. All project-generated traffic has been assigned to the shared access extending north from SE Mile Hill Drive. Percentages are generally based on locations of nearby roadways and observations of existing travel patterns. It should be noted that no trip reductions associated with the former on-site land use were attributed to the proposed development's trip generation/distribution as the health and fitness facility on-site was closed at the time of field counts.

4.3 Future Peak Hour Volumes

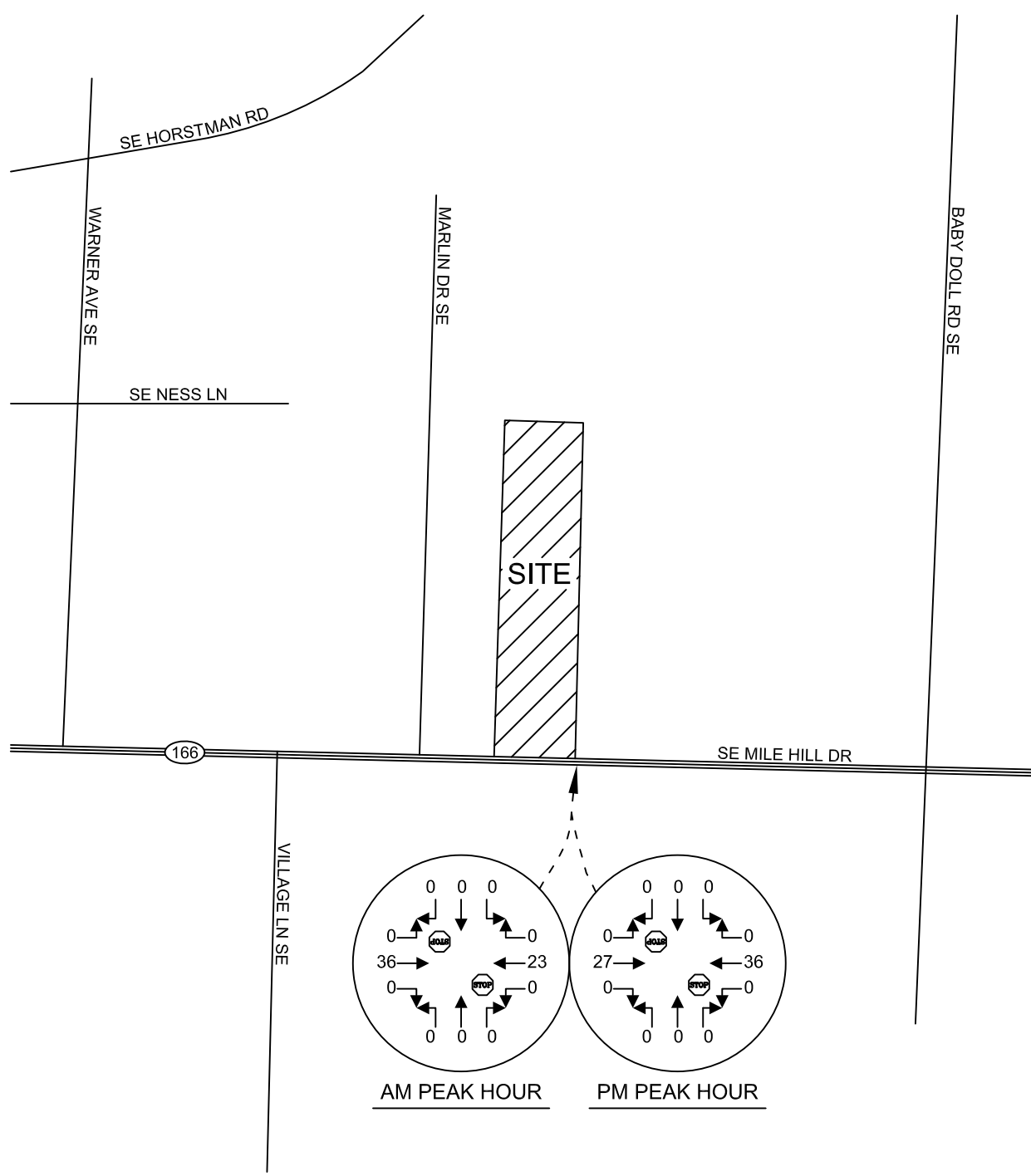
A six-year horizon of 2028 was used for future traffic delay analysis. Forecast weekday peak hour volumes were derived by applying a 2.0 percent compound annual growth rate to the existing volumes³. Moreover, pipeline volumes associated with Fircrest Ridge Apartments, Payseno Lane Apartments, Overlook Apartments Phase 1 and 2, Overlook Apartments Phase 3, and the Four Seasons Plat projects were analyzed in terms forecast (pipeline) volumes and included in Figure 5. Forecast 2028 weekday peak hour volumes without and with the addition of project-generated traffic are shown in Figures 6 and 7, respectively.

³ Kitsap 2035 Countywide Population and Housing Growth which indicates a annual growth rate of 1.66% for the Port Orchard UGA.



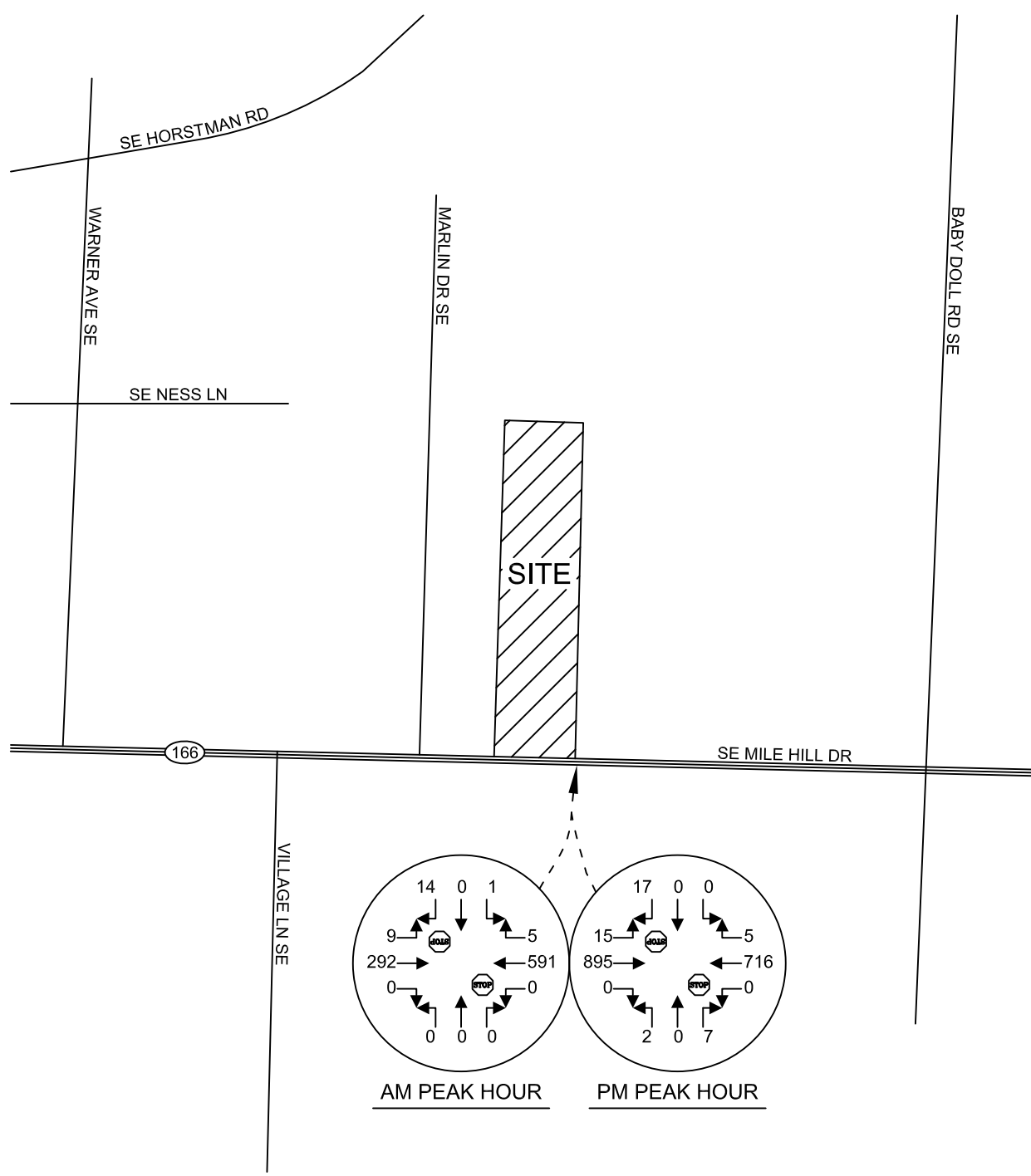
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PACIFIC BUILDING CONVERSION
WEEKDAY PEAK HOUR TRIP DISTRIBUTION & ASSIGNMENT
FIGURE 4



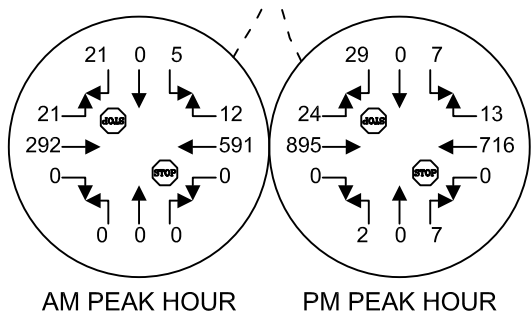
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PACIFIC BUILDING CONVERSION
WEEKDAY PEAK HOUR PIPELINE VOLUMES
FIGURE 5



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PACIFIC BUILDING CONVERSION
FORECAST 2028 WEEKDAY PEAK HOUR BACKGROUND VOLUMES
FIGURE 6



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TRAFFIC AND CIVIL ENGINEERING

PACIFIC BUILDING CONVERSION
FORECAST 2028 WEEKDAY PEAK HOUR VOLUMES WITH PROJECT
FIGURE 7

4.4 Future Level of Service

Level of service analyses were made of the future weekday peak hour volumes without (background) and with project related trips added to the key roadways and intersections. This analysis once again involved the use of the *Synchro 11* analysis program. Delays for the shared access intersection under future conditions are shown below in Table 3.

Table 3: Forecast 2028 Weekday Peak Hour Level of Service

Delays given in seconds per vehicle

Intersection	Control	Peak Hour	Movement	<u>Background</u>		<u>With Project</u>	
				LOS	Delay	LOS	Delay
SE Mile Hill Dr & Shared Access	Stop	AM	SB	B	13.9	B	14.8
		PM	NB	C	18.5	C	18.8

Forecast 2028 weekday peak hour Level of Service at the shared access on SE Mile Hill Drive is shown to operate with LOS C or better conditions with or without the proposed project. SE Mile Hill Road has a continuous center two-way left-turn lane (TWLTL) available for use at the proposed access intersection. No operational deficiencies are identified as a result of the proposed development.

4.5 Parking Analysis

To quantify parking demands associated with the proposed development, an operational analysis accounting for site-specific characteristics associated with the existing 4303 Kitsap Way facility was performed. As illustrated in the conceptual site plan (see Figure 2), approximately 40 paved parking stalls are proposed on-site. A loading/unloading zone will additionally be provided, located adjacent the easterly side of the building. Moreover, an existing overflow gravel parking lot is proposed to remain within the southerly portion of the subject site, which may accommodate up to approximately 20 parked vehicles.

As previously noted, the Pacific Building Conversion facility is to operate as a low-barrier housing facility accommodating up to 75 guests with three shifts of staffing per day. Each shift is anticipated to comprise a specified number of Kitsap Rescue Mission (KRM) managers/ additional equipment trailers, employees, service providers, volunteers and additional miscellaneous trips. A spreadsheet outlining the total number of parked vehicles/ trips associated with each respective shift is attached in the appendix, which was also utilized to derive trip generation in the preceding section of this report. It should be noted that the day shift is anticipated to comprise peak parking activity generated by the subject site. Therefore, day shift parking assumptions were utilized hereinafter.

It is anticipated that each employee, KRM manager/equipment vehicle and service provider would drive to work and require a parking stall. The day shift is anticipated to comprise a maximum of **16 personnel/vehicles** associated with the aforementioned trip types. Moreover, actual recorded resident vehicle ownership rates from the existing 4303 Kitsap Way facility indicate that approximately 15 residents at the proposed shelter will have a vehicle and park on-site. During peak parking events (day shift), it is assumed that approximately 75% of all residents may be on-site, as a portion may be off-site performing errands, at work, etc. Therefore, an additional **11 residents** may be concurrently parked on-site during the peak parking event.

A maximum of **2 volunteers** will also drive to and park at the shelter during a given day shift. It should be noted that additional trips may occur to the site in the form of family/friend visits, deliveries and other miscellaneous trips (delineated as “other” in the attached spreadsheet). The attached spreadsheet states that up to 14 “other” trip types may occur during a day shift. It is anticipated that a portion of these trips, such as deliveries, will be accommodated by the proposed loading/ unloading zone on-site. As such, approximately 50% of all specified “other” trips were estimated to occur during a day shift peak parking event, totaling an additional demand of **7 parking stalls**.

Given all of the previously outlined site characteristics, a maximum parking demand was derived in sum of each of the individual trip types, which is summarized below:

- KRM, employees and service providers – day shift: *16 parked vehicles*
- 75% Residents: *11 parked vehicles*
- Volunteers: *2 parked vehicles*
- 50% Other: *7 parked vehicles*

Accounting for all of the above noted trip types and personnel on-site, an average peak parking demand of **36 parking stalls** may be expected during a given day shift. With 40 paved parking stalls provided on-site, peak parking demands generated by the proposed facility are anticipated to be accommodated and no parking deficiencies are identified.

Assuming that a shift change may result in an overlap of personnel on-site, a maximum of 11 additional swing shift personnel may arrive on-site concurrently for a brief duration as the previous day shift of 16 personnel depart. It should be noted that volunteers, and “other” trip types would likely not be on-site during shift changes. Should parking spillover occur during said shift change events, the gravel parking lot located in the southerly portion of the subject site could accommodate any excess parking demands.

5. SUMMARY

Pacific Building Conversion is a proposed transitional housing facility supporting up to 75 residents, located within the Port Orchard Urban Growth Area of Kitsap County. The development proposal includes relocating the operations of an existing low-barrier shelter located at 4303 Kitsap Way, serving South Kitsap, to 4459 SE Mile Hill Drive. The proposed facility is situated on 2.75-acre tax parcel #: 302402-4-144-2009, which currently comprises a vacant, 20,040 square foot facility formerly used as a health and fitness club. Access to and from the project is proposed via one existing, shared driveway extending north from SE Mile Hill Shelter along the easterly parcel edge. Existing Level of Service (LOS) is provided in Table 1, which shows the access intersection on SE Mile Hill Drive operating with LOS C or better conditions during the weekday peak hours of study.

Based on sample site data from the existing low-barrier facility located at 4303 Kitsap Way, the development would be anticipated to generate 178 new daily weekday trips with 30 trips (19 inbound / 11 outbound) occurring in the AM peak hour and 33 trips (14 inbound / 19 outbound) in the PM peak hour. For forecast analysis, a 6-year horizon was evaluated to assess impacts under future conditions. Table 3 summarizes forecast 2028 weekday peak hour LOS delays without and with the project. Forecast 2028 conditions at the SE Mile Hill Drive access intersection are shown to continue to operate with LOS C or better conditions with or without the addition of project generated traffic. No level of service deficiencies are identified as a result of the proposed Pacific Building Conversion project.

A parking demand analysis was performed, which utilized site characteristic data derived from the current low-barrier housing site located at 4303 Kitsap Way. The analysis yielded an estimated peak parking total of 36 stalls demanded on-site. Overall, the development proposal comprising 40 paved parking stalls is therefore anticipated to meet site-generated parking demands. Should additional parking capacity be required, a gravel lot in the southerly portion of the subject site may accommodate up to an additional 20 parked vehicles. No parking deficiencies are identified as a result of the proposed development.

As the proposed development is anticipated to generate no net new average weekday daily or PM peak hour trips and the proposed SE Mile Hill Drive access is shown to have acceptable service levels, no mitigation is identified at this time.

PACIFIC BUILDING CONVERSION
TRAFFIC IMPACT ANALYSIS

APPENDIX

Heath & Associates

PO Box 397 Puyallup, WA 98371

File Name : 4941a
 Site Code : 00004941
 Start Date : 6/29/2022
 Page No : 1

Groups Printed- Passenger + - Heavy

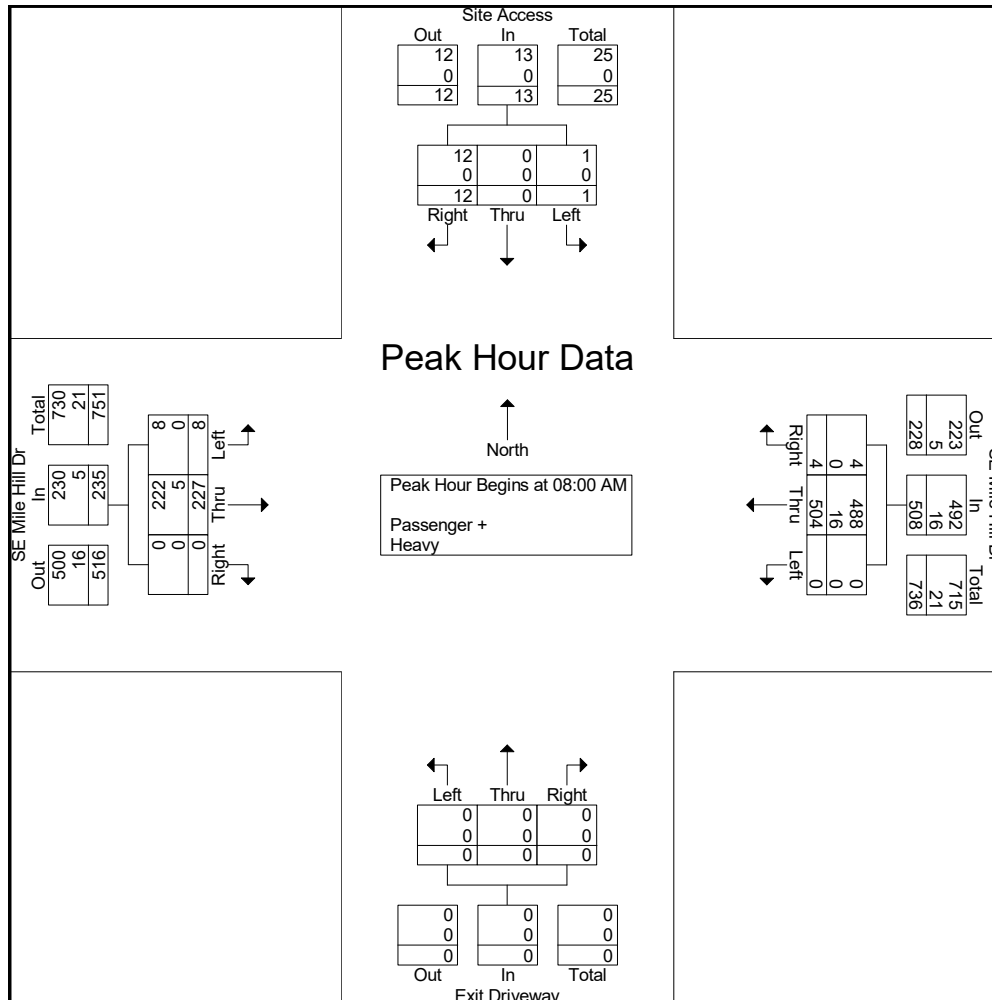
Start Time	Site Access Southbound				SE Mile Hill Dr Westbound				Exit Driveway Northbound				SE Mile Hill Dr Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
07:00 AM	1	0	0	1	0	109	0	109	0	0	0	0	0	36	4	40	150
07:15 AM	0	0	0	0	0	108	0	108	0	0	1	1	0	41	0	41	150
07:30 AM	1	0	0	1	1	105	0	106	0	0	0	0	0	51	4	55	162
07:45 AM	2	0	0	2	4	119	0	123	0	0	0	0	0	66	8	74	199
Total	4	0	0	4	5	441	0	446	0	0	1	1	0	194	16	210	661
08:00 AM	2	0	0	2	4	91	0	95	0	0	0	0	0	44	5	49	146
08:15 AM	1	0	1	2	0	120	0	120	0	0	0	0	0	52	1	53	175
08:30 AM	2	0	0	2	0	141	0	141	0	0	0	0	0	64	0	64	207
08:45 AM	7	0	0	7	0	152	0	152	0	0	0	0	0	67	2	69	228
Total	12	0	1	13	4	504	0	508	0	0	0	0	0	227	8	235	756
Grand Total	16	0	1	17	9	945	0	954	0	0	1	1	0	421	24	445	1417
Apprch %	94.1	0	5.9		0.9	99.1	0		0	0	100		0	94.6	5.4		
Total %	1.1	0	0.1	1.2	0.6	66.7	0	67.3	0	0	0.1	0.1	0	29.7	1.7	31.4	
Passenger +	16	0	1	17	9	922	0	931	0	0	1	1	0	407	24	431	1380
% Passenger +	100	0	100	100	100	97.6	0	97.6	0	0	100	100	0	96.7	100	96.9	97.4
Heavy	0	0	0	0	0	23	0	23	0	0	0	0	0	14	0	14	37
% Heavy	0	0	0	0	0	2.4	0	2.4	0	0	0	0	0	3.3	0	3.1	2.6

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PO Box 397 Puyallup, WA 98371

File Name : 4941a
 Site Code : 00004941
 Start Date : 6/29/2022
 Page No : 2

Start Time	Site Access Southbound				SE Mile Hill Dr Westbound				Exit Driveway Northbound				SE Mile Hill Dr Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	2	0	0	2	4	91	0	95	0	0	0	0	0	44	5	49	146
08:15 AM	1	0	1	2	0	120	0	120	0	0	0	0	0	52	1	53	175
08:30 AM	2	0	0	2	0	141	0	141	0	0	0	0	0	64	0	64	207
08:45 AM	7	0	0	7	0	152	0	152	0	0	0	0	0	67	2	69	228
Total Volume	12	0	1	13	4	504	0	508	0	0	0	0	0	227	8	235	756
% App. Total	92.3	0	7.7		0.8	99.2	0		0	0	0		0	96.6	3.4		
PHF	.429	.000	.250	.464	.250	.829	.000	.836	.000	.000	.000	.000	.000	.847	.400	.851	.829
Passenger +	12	0	1	13	4	488	0	492	0	0	0	0	0	222	8	230	735
% Passenger +	100	0	100	100	100	96.8	0	96.9	0	0	0	0	0	97.8	100	97.9	97.2
Heavy	0	0	0	0	0	16	0	16	0	0	0	0	0	5	0	5	21
% Heavy	0	0	0	0	0	3.2	0	3.1	0	0	0	0	0	2.2	0	2.1	2.8



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File Name : 4941b
 Site Code : 00004941
 Start Date : 6/29/2022
 Page No : 1

Groups Printed- Passenger + - Heavy

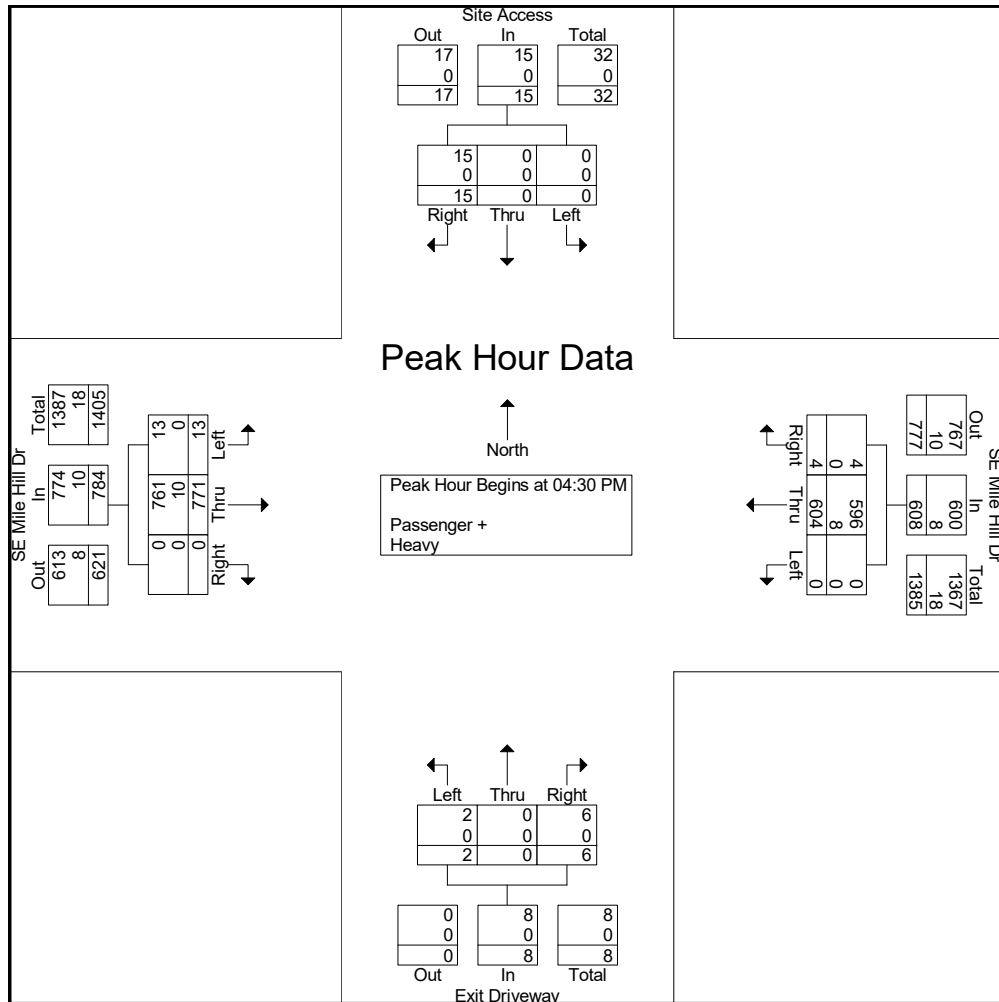
Start Time	Site Access Southbound				SE Mile Hill Dr Westbound				Exit Driveway Northbound				SE Mile Hill Dr Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
04:00 PM	3	0	1	4	0	133	0	133	1	0	1	2	0	195	3	198	337
04:15 PM	3	0	0	3	2	138	0	140	3	0	0	3	0	179	3	182	328
04:30 PM	4	0	0	4	1	153	0	154	0	0	0	0	0	201	1	202	360
04:45 PM	2	0	0	2	1	151	0	152	0	0	0	0	0	212	1	213	367
Total	12	0	1	13	4	575	0	579	4	0	1	5	0	787	8	795	1392
05:00 PM	2	0	0	2	0	150	0	150	1	0	0	1	0	187	6	193	346
05:15 PM	7	0	0	7	2	150	0	152	5	0	2	7	0	171	5	176	342
05:30 PM	1	0	0	1	2	125	0	127	0	0	1	1	0	172	5	177	306
05:45 PM	5	0	2	7	0	101	0	101	1	0	4	5	0	168	3	171	284
Total	15	0	2	17	4	526	0	530	7	0	7	14	0	698	19	717	1278
Grand Total	27	0	3	30	8	1101	0	1109	11	0	8	19	0	1485	27	1512	2670
Apprch %	90	0	10		0.7	99.3	0		57.9	0	42.1		0	98.2	1.8		
Total %	1	0	0.1	1.1	0.3	41.2	0	41.5	0.4	0	0.3	0.7	0	55.6	1	56.6	
Passenger +	27	0	3	30	8	1090	0	1098	11	0	8	19	0	1469	27	1496	2643
% Passenger +	100	0	100	100	100	99	0	99	100	0	100	100	0	98.9	100	98.9	99
Heavy	0	0	0	0	0	11	0	11	0	0	0	0	0	16	0	16	27
% Heavy	0	0	0	0	0	1	0	1	0	0	0	0	0	1.1	0	1.1	1

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PO Box 397 Puyallup, WA 98371

File Name : 4941b
 Site Code : 00004941
 Start Date : 6/29/2022
 Page No : 2

Start Time	Site Access Southbound				SE Mile Hill Dr Westbound				Exit Driveway Northbound				SE Mile Hill Dr Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	4	0	0	4	1	153	0	154	0	0	0	0	0	201	1	202	360
04:45 PM	2	0	0	2	1	151	0	152	0	0	0	0	0	212	1	213	367
05:00 PM	2	0	0	2	0	150	0	150	1	0	0	1	0	187	6	193	346
05:15 PM	7	0	0	7	2	150	0	152	5	0	2	7	0	171	5	176	342
Total Volume	15	0	0	15	4	604	0	608	6	0	2	8	0	771	13	784	1415
% App. Total	100	0	0		0.7	99.3	0		75	0	25		0	98.3	1.7		
PHF	.536	.000	.000	.536	.500	.987	.000	.987	.300	.000	.250	.286	.000	.909	.542	.920	.964
Passenger +	15	0	0	15	4	596	0	600	6	0	2	8	0	761	13	774	1397
% Passenger +	100	0	0	100	100	98.7	0	98.7	100	0	100	100	0	98.7	100	98.7	98.7
Heavy	0	0	0	0	0	8	0	8	0	0	0	0	0	10	0	10	18
% Heavy	0	0	0	0	0	1.3	0	1.3	0	0	0	0	0	1.3	0	1.3	1.3



Parking Worksheet
Kitsap Rescue Mission

8 am - 4:30 pm
4 pm - 12:30 am
12 am - 8:30 am
8 am - 4:30 pm
4 pm - 12:30 am
12 am - 8:30 am
8 am - 4:30 pm
4 pm - 12:30 am
12 am - 8:30 am
8 am - 4:30 pm
4 pm - 12:30 am
12 am - 8:30 am
8 am - 4:30 pm
4 pm - 12:30 am
12 am - 8:30 am
8 am - 4:30 pm
4 pm - 12:30 am
12 am - 8:30 am
8 am - 4:30 pm
4 pm - 12:30 am
12 am - 8:30 am

Onsite Parking @ Mile Hill facility
KRM Managers (KRM)
How many vehicles will KRM managers daily park onsite? 2
Will KRM park work related equipment/trailers onsite daily? 2
Employees (E)
What are regular employee shifts/hours? (See I, II, III) OK
How many staff per shift? (not KRM managers)
How many staff use daily public transportation/carpool/walk? 0
How many staff drive and park? All
Volunteers (V)
How many volunteers will drive and park at the shelter? 3-4 per day
How many volunteers use public transportation/carpool/walk? 0
Residents (R)
How many residents have a vehicle? 15
How many residents will park everyday onsite? 15
How many will use public transportation/carpool/walk? 10-20
How many campers, trailers, etc will they park onsite? 0
Other (O)
Will residents have family and friends visit? Rarely
When will family and friends park onsite? Not allowed to park
Service Providers/Emergency vehicle (SP) See below
Which SP make regular trips to the shelter?
What shifts will SP park onsite?
How many SP will use public transportation/carpool/walk?
How many SP will drive and park onsite?
Will SP park work equipment/trailers onsite?

	Monday			Tuesday			Wednesday			Thursday			Friday			Saturday			Sunday		
Shift	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
KRM:	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
E:	10	5	2	10	5	2	10	5	2	10	5	2	10	5	2	5	5	2	5	5	2
SP:	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2						
V:	1	1		2	2		2	2		2	3		1	2		1	2		1	2	
R:	14	16		13	15		11	17		12	13		16	11		17	14		8	11	
O:	14	11		12	9		14	13		11	15		9	6		5	8		3	6	
Total	45	39	8	43	37	8	43	43	8	41	42	8	42	30	8	32	33	6	21	28	6

Shift I	8 hrs	8:00 am - 4:30pm
Shift II	8 hrs	4:00 pm -12:30 am
Shift III	8 hrs	12:00 am - 8:30 am

KRM:	KRM Staff
E:	Employees
SP:	Service Providers
V:	Visitors
R:	Residents
O:	Other

Staff per shift (not managers)

- Weekday day shift (11 to 13 staff)
- Swing shift (4 to 5 staff)
- Graveyard shift (3 staff)
- Weekend days (8 to 9 staff)
- Swing (4 to 5 staff)
- Grave (3 staff)

Service Providers

- Service providers: Peninsula Health and KCR
- Service providers - working hours (2 to 3 vehicles)
- Service providers - no public transportation used
- Service providers - loading zone area - medical bus 1 or 2 days a week, ambulance, fire, police as requested.
- Food donations delivered to facility 2 x per day in loading zone.

Health/Fitness Club (492)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

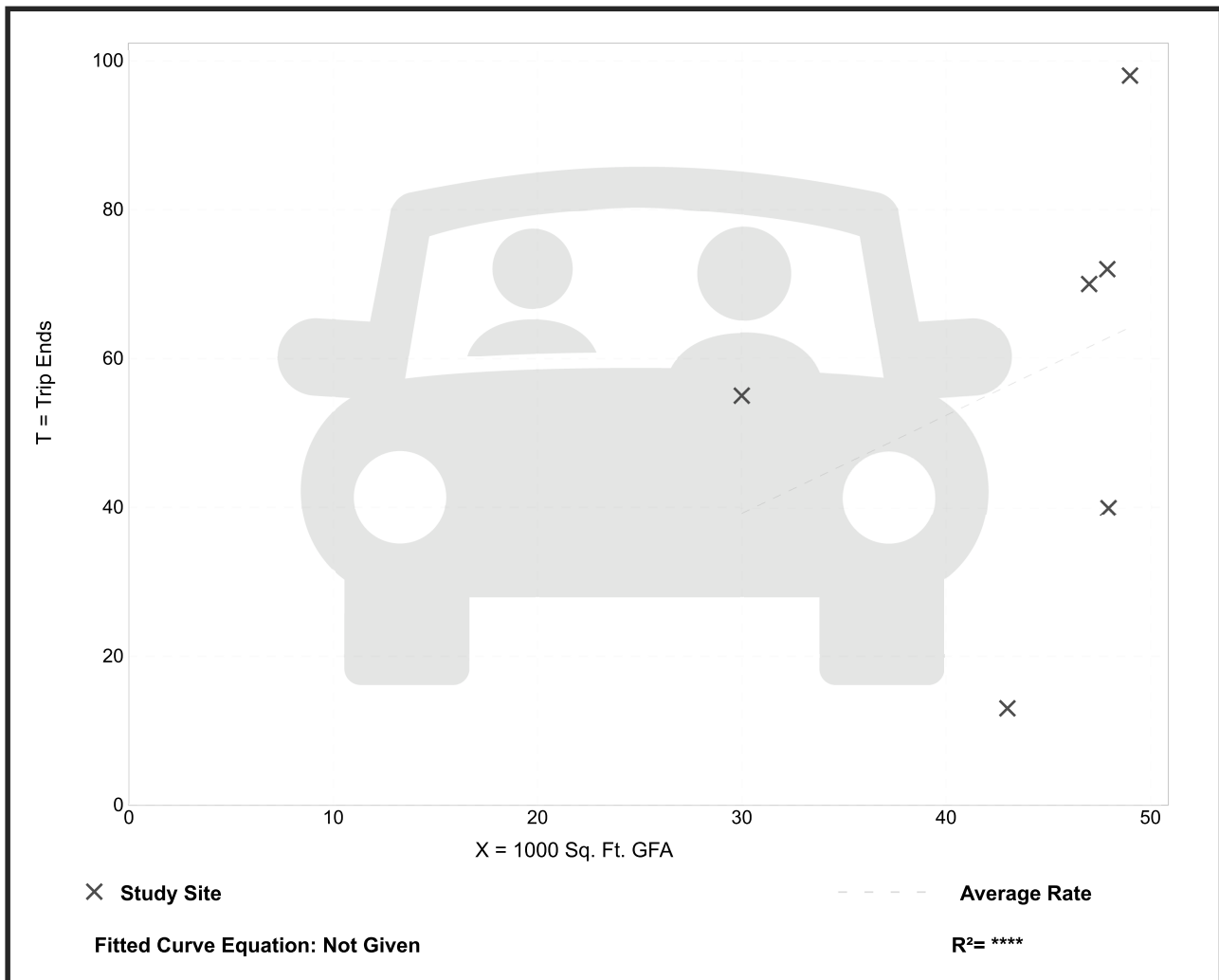
Setting/Location: General Urban/Suburban

Number of Studies: 6
 Avg. 1000 Sq. Ft. GFA: 44
 Directional Distribution: 51% entering, 49% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.31	0.30 - 2.00	0.64

Data Plot and Equation



Trip Gen Manual, 11th Edition

Institute of Transportation Engineers

Health/Fitness Club (492)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

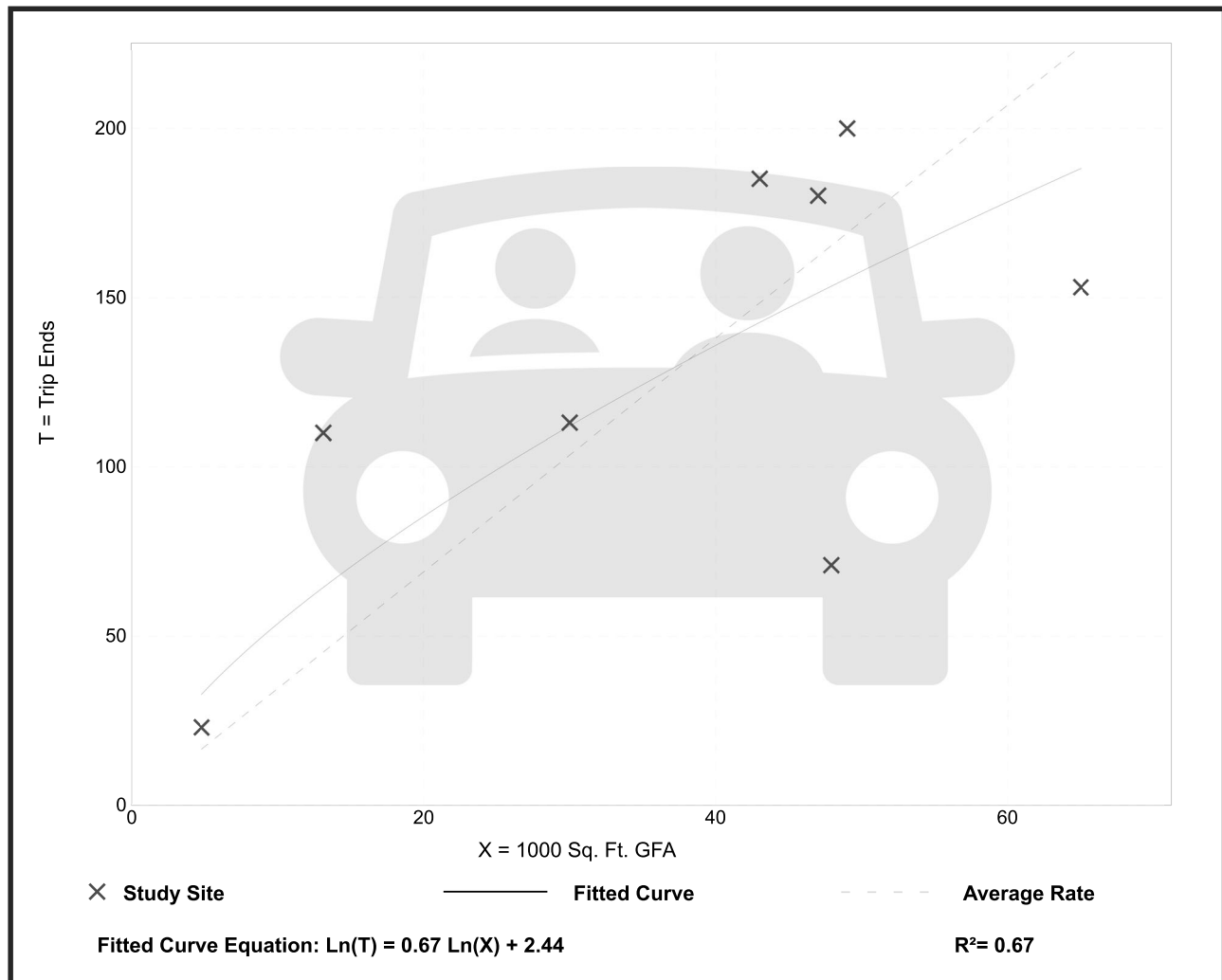
Setting/Location: General Urban/Suburban

Number of Studies: 8
 Avg. 1000 Sq. Ft. GFA: 37
 Directional Distribution: 57% entering, 43% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
3.45	1.48 - 8.37	1.57

Data Plot and Equation



Trip Gen Manual, 11th Edition

● Institute of Transportation Engineers

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Vol, veh/h	8	227	0	0	504	4	0	0	0	1	0	12
Future Vol, veh/h	8	227	0	0	504	4	0	0	0	1	0	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	1	2	1	1	3	1	1	1	1	1	1	1
Mvmt Flow	10	273	0	0	607	5	0	0	0	1	0	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	612	0	0	273	0	0	910	905	273	903	903	610
Stage 1	-	-	-	-	-	-	293	293	-	610	610	-
Stage 2	-	-	-	-	-	-	617	612	-	293	293	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	972	-	-	1296	-	-	256	277	768	259	278	496
Stage 1	-	-	-	-	-	-	717	672	-	483	486	-
Stage 2	-	-	-	-	-	-	479	485	-	717	672	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	972	-	-	1296	-	-	247	274	768	257	275	496
Mov Cap-2 Maneuver	-	-	-	-	-	-	356	371	-	370	376	-
Stage 1	-	-	-	-	-	-	710	665	-	478	486	-
Stage 2	-	-	-	-	-	-	465	485	-	710	665	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0	0	12.7
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	972	-	-	1296	-	-	483
HCM Lane V/C Ratio	-	0.01	-	-	-	-	-	0.032
HCM Control Delay (s)	0	8.7	-	-	0	-	-	12.7
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0.1

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Vol, veh/h	13	771	0	0	604	4	2	0	6	0	0	15
Future Vol, veh/h	13	771	0	0	604	4	2	0	6	0	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	14	803	0	0	629	4	2	0	6	0	0	16

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	633	0	0	803	0	0	1470	1464	803	1465	1462	631
Stage 1	-	-	-	-	-	-	831	831	-	631	631	-
Stage 2	-	-	-	-	-	-	639	633	-	834	831	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	955	-	-	825	-	-	106	129	385	107	129	483
Stage 1	-	-	-	-	-	-	365	386	-	471	476	-
Stage 2	-	-	-	-	-	-	466	475	-	364	386	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	955	-	-	825	-	-	101	127	385	104	127	483
Mov Cap-2 Maneuver	-	-	-	-	-	-	226	247	-	229	250	-
Stage 1	-	-	-	-	-	-	360	380	-	464	476	-
Stage 2	-	-	-	-	-	-	451	475	-	353	380	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0	16.3	12.7
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	327	955	-	-	825	-	-	483
HCM Lane V/C Ratio	0.025	0.014	-	-	-	-	-	0.032
HCM Control Delay (s)	16.3	8.8	-	-	0	-	-	12.7
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Vol, veh/h	9	292	0	0	591	5	0	0	0	1	0	14
Future Vol, veh/h	9	292	0	0	591	5	0	0	0	1	0	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	1	2	1	1	3	1	1	1	1	1	1	1
Mvmt Flow	11	352	0	0	712	6	0	0	0	1	0	17

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	718	0	0	352	0	0	1098	1092	352	1089	1089	715
Stage 1	-	-	-	-	-	-	374	374	-	715	715	-
Stage 2	-	-	-	-	-	-	724	718	-	374	374	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	888	-	-	1212	-	-	191	215	694	194	216	432
Stage 1	-	-	-	-	-	-	649	619	-	423	436	-
Stage 2	-	-	-	-	-	-	419	435	-	649	619	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	888	-	-	1212	-	-	182	212	694	192	213	432
Mov Cap-2 Maneuver	-	-	-	-	-	-	298	320	-	312	325	-
Stage 1	-	-	-	-	-	-	641	612	-	418	436	-
Stage 2	-	-	-	-	-	-	403	435	-	641	612	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0	0	13.9
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	888	-	-	1212	-	-	421
HCM Lane V/C Ratio	-	0.012	-	-	-	-	-	0.043
HCM Control Delay (s)	0	9.1	-	-	0	-	-	13.9
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0.1

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Vol, veh/h	15	895	0	0	716	5	2	0	7	0	0	17
Future Vol, veh/h	15	895	0	0	716	5	2	0	7	0	0	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	16	932	0	0	746	5	2	0	7	0	0	18

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	751	0	0	932	0	0	1722	1715	932	1717	1713	749
Stage 1	-	-	-	-	-	-	964	964	-	749	749	-
Stage 2	-	-	-	-	-	-	758	751	-	968	964	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	863	-	-	738	-	-	71	91	324	71	91	413
Stage 1	-	-	-	-	-	-	308	335	-	405	421	-
Stage 2	-	-	-	-	-	-	401	420	-	307	335	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	863	-	-	738	-	-	67	89	324	68	89	413
Mov Cap-2 Maneuver	-	-	-	-	-	-	182	206	-	185	208	-
Stage 1	-	-	-	-	-	-	302	329	-	397	421	-
Stage 2	-	-	-	-	-	-	384	420	-	295	329	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0	18.5	14.1
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	276	863	-	-	738	-	-	413
HCM Lane V/C Ratio	0.034	0.018	-	-	-	-	-	0.043
HCM Control Delay (s)	18.5	9.2	-	-	0	-	-	14.1
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.1

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Vol, veh/h	21	292	0	0	591	12	0	0	0	5	0	21
Future Vol, veh/h	21	292	0	0	591	12	0	0	0	5	0	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	1	2	1	1	3	1	1	1	1	1	1	1
Mvmt Flow	25	352	0	0	712	14	0	0	0	6	0	25

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	726	0	0	352	0	0	1134	1128	352	1121	1121	719
Stage 1	-	-	-	-	-	-	402	402	-	719	719	-
Stage 2	-	-	-	-	-	-	732	726	-	402	402	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	882	-	-	1212	-	-	181	205	694	184	207	430
Stage 1	-	-	-	-	-	-	627	602	-	421	434	-
Stage 2	-	-	-	-	-	-	414	431	-	627	602	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	882	-	-	1212	-	-	167	199	694	180	201	430
Mov Cap-2 Maneuver	-	-	-	-	-	-	277	305	-	301	316	-
Stage 1	-	-	-	-	-	-	609	585	-	409	434	-
Stage 2	-	-	-	-	-	-	390	431	-	609	585	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	0	0	14.8
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	882	-	-	1212	-	-	397
HCM Lane V/C Ratio	-	0.029	-	-	-	-	-	0.079
HCM Control Delay (s)	0	9.2	-	-	0	-	-	14.8
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	-	0.3

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Vol, veh/h	24	895	0	0	716	13	2	0	7	7	0	29
Future Vol, veh/h	24	895	0	0	716	13	2	0	7	7	0	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	25	932	0	0	746	14	2	0	7	7	0	30

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	760	0	0	932	0	0	1750	1742	932	1739	1735	753
Stage 1	-	-	-	-	-	-	982	982	-	753	753	-
Stage 2	-	-	-	-	-	-	768	760	-	986	982	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	856	-	-	738	-	-	67	87	324	69	88	411
Stage 1	-	-	-	-	-	-	301	329	-	403	419	-
Stage 2	-	-	-	-	-	-	396	416	-	300	329	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	856	-	-	738	-	-	61	84	324	66	85	411
Mov Cap-2 Maneuver	-	-	-	-	-	-	171	198	-	180	203	-
Stage 1	-	-	-	-	-	-	292	319	-	391	419	-
Stage 2	-	-	-	-	-	-	367	416	-	285	319	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0	18.8	17.3
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	270	856	-	-	738	-	-	329
HCM Lane V/C Ratio	0.035	0.029	-	-	-	-	-	0.114
HCM Control Delay (s)	18.8	9.3	-	-	0	-	-	17.3
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.4



NON-WETLAND DETERMINATION

July 12, 2022



Pacific Building Conversion *Port Orchard, Washington*

Prepared for
Rice Fergus Miller Architects
Attn: Greg Belding
275 5th Street, Suite 100
Bremerton, WA 98337
360-377-8773

Prepared by
Ecological Land Services
1157 3rd Avenue, Suite 220A • Longview, WA 98632
(360) 578-1371 • Project Number 2521.06

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APPENDIX A

Wetland Determination Data Forms

SIGNATURE PAGE

The information and data in this report were compiled and prepared under the supervision and direction of the undersigned.



Joanne Bartlett, SPWS
Professional Biologist



Emma Crockett
Biologist

INTRODUCTION

Ecological Land Services, Inc. (ELS) was contracted by Rice Fergus Miller Architects to complete a non-wetland determination and report for the property at 4459 SE Mile Hill Drive, Kitsap County Tax Parcel Nos. 302402-4-144-2009, 302402-4-193-2009, and 302402-4-214-2004 within a portion of Section 30, Township 24 North, Range 2 East of the Willamette Meridian, in Port Orchard, Washington (Figure 1). This report summarizes findings of the non-wetland determination according to the Kitsap County Code (*KCC*), *Chapter 19.200*.

METHODOLOGY

ELS follows the Routine Determination Method in the Western Mountains, Valleys, and Coast Region according to the Corps' *Wetland Delineation Manual* (Environmental Laboratory 1987), and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Region (Version 2.0)* (U.S. Army Engineer Research and Development Center, 2010).

The Routine Determination Method examines three parameters—vegetation, soils, and hydrology—to determine if wetland is present. By definition, wetlands are those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands are regulated as “Waters of the United States” by the Corps, as “Waters of the State” by the Washington Department of Ecology (DOE), and locally by Kitsap County.

ELS biologists visited the study area on June 6, 2022, and collected vegetation, soil, and hydrology data at seven test plots on the proposed shelter property, as well as the adjacent Kitsap County owned properties (Figure 2). It was determined that there are no wetlands within the study area because the data revealed that at least one of the required wetland parameters was absent at each test plot and there was no evidence of wetland characteristics in other areas. No offsite wetlands or other critical areas were identified within 300 feet of the study area (Appendix A). Photos accompany this report to visually document conditions observed during the site visit and are included on photoplates attached with the figures.

STUDY AREA DESCRIPTION

This study area is composed of three properties and is accessed on the north side of SE Mile Hill Drive in Port Orchard, Washington (Figure 1). The southwestern property is developed with an existing parking lot and large commercial building; it is the proposed site of the Mile Hill Drive Homeless Shelter. The northeast portion of the study area contains an existing detention pond and outlet as well as a gravel road along the eastern boundary. The study area is forested with a dense shrub layer on the eastern portion and an abundant herbaceous layer in the western portion of the study area. The surrounding properties are smaller and contain single family homes to the east and similarly developed businesses to the south and east. The study area is relatively level in the southwest portion and slopes down from the existing building and the former drain-field to the north and east towards the forested area and neighboring parking lot.

VEGETATION

The vegetation varies throughout the study area. The western portion of the study area is dominated by maintained grasses and weeds around the existing building and parking lots with a sparse forested community composed of western red cedar (*Thuja plicata*, FAC) and Douglas fir (*Pseudotsuga menziesii*, FACU) at the south end. The sparse shrub layer was composed of Oregon grape (*Mahonia nervosa*, FACU) and salal (*Gaultheria shallon*, FACU) with an herbaceous layer of common nipplewort (*Lapsana communis*, FACU), hairy cat's ear (*Hypochaeris radicata*, FACU), orchard grass (*Dactylis glomerata*, FACU), bracken fern (*Pteridium aquilinum*, FACU), twinflower (*Linnaea borealis*, FACU), and starflower (*Trientalis borealis*, FAC).

The northwestern and eastern portions of the study area are forested with varying percentages of herbaceous and scrub-shrub vegetation. The forested layer was dominated by big leaf maple (*Acer macrophyllum*, FACU), beaked hazelnut (*Corylus cornuta*, FACU), western red cedar, and red alder (*Alnus rubra*, FAC). The woody vine and shrub layer was dominated by Himalayan blackberry (*Rubus armeniacus*, FAC) and salmonberry (*Rubus spectabilis*, FAC), with sparse amounts of trailing blackberry (*Rubus ursinus*, FACU) and English holly (*Ilex aquifolium*, FACU). Dense populations of horsetail (*Equisetum arvense*, FAC) and creeping buttercup (*Ranunculus repens*, FAC) dominated the herbaceous layer in the northeastern portion of the study area while sword fern (*Polystichum munitum*, FACU), bleeding heart (*Dicentra formosa*, FACU), and bracken fern (*Pteridium aquilinum*, FACU) were more predominant in the northwestern portion of the study area. The hydrophytic vegetation criterion was met at five out of seven test plots, but all areas were determined to be upland because they lacked wetland hydrology and/or hydric soil indicators (Appendix A).

The dominant vegetation found onsite is recorded on the attached wetland determination data forms (Appendix A). The indicator status, following the common and scientific names, indicates how likely a species is to be found in wetlands. Listed from most likely to least likely to be found in wetlands, the indicator status categories are:

- **OBL** (obligate wetland) – Almost always occur in wetlands.
- **FACW** (facultative wetland) – Usually occur in wetlands, but may occur in non-wetlands.
- **FAC** (facultative) – Occur in wetlands and non-wetlands.
- **FACU** (facultative upland) – Usually occur in non-wetlands, but may occur in wetlands.
- **UPL** (obligate upland) – Almost never occur in wetlands.
- **NI** (no indicator) – Status not yet determined.

SOILS

As referenced on the Natural Resources Conservation Service (NRCS 2022) website, the soil mapped across the study area is Harstine gravelly ashy sandy loam (14 & 15) (Figure 3). Harstine soils are moderately deep, moderately well drained soils formed in sandy glacial drift with an influence of volcanic ash over dense glaciomarine deposits. Harstine soils are not classified hydric¹ (NRCS 2022).

¹ Areas mapped as hydric soils do not necessarily mean that an area is or is not a wetland – hydrology, hydrophytic vegetation, and hydric soils must all be present to classify an area as a wetland.

The soil profile in each of the test plots revealed surface layers 4 to 6 inches thick and ranged from black (10YR 2/1) to very dark grayish brown (10YR 3/2) matrix colors. In the second and third layers, the soil profile ranged from very dark gray (10YR 3/1) to brown (10YR 5/3). Test Plots 2, 4, and 7 contained 1 percent dark yellowish brown (10YR 3/6 & 10YR 4/6) redoximorphic concentrations within the matrix.

Test Plot 3 contained disturbed soils with inconsistent horizons. The 6-inch surface layer consisted of a very dark grayish brown (10YR 3/2) sandy loam, followed by 4 inches of a grayish brown (10YR 5/2) clay loam matrix with 10 percent dark yellowish brown (10YR 4/6) redoximorphic concentrations. The third layer was a black (10YR 2/1) sandy loam. The second layer meets hydric soil indicator Depleted Matrix (F3) but is in between two non-hydric layers and contains disturbed soil features including burned wood and other debris, so the soil profile was determined to be non-hydric. Hydric soil indicators were not met in any of the other test plots due to high matrix chromas and low percentages of redoximorphic features.

HYDROLOGY

Hydrology was present as high water table (A2) and/or saturation (A3) at 4 of the 7 test plots at depths ranging from 5 to 16 inches. In the four test plots displaying wetland hydrology, non-hydric soil conditions were observed. The presence of water in these locations can be attributed to the amount of precipitation that fell prior to the June 6th site visit. Although hydrology was present, it does not appear to be present long enough or often enough to support hydric soils. The other test plots and areas outside of the test plots were dry and did not show any evidence to indicate wetland hydrology.

The existing detention pond contained high water at the time of the visit and within the overflow outlet at the northeast corner (Photoplate 1). These features were artificially created and are not considered priority habitats or critical areas. Additionally, the areas upslope of the detention pond where water was observed appears to represent a designated path that conveys runoff from the upslope businesses into the pond.

CRITICAL AREAS INVENTORIES²

NATIONAL WETLAND INVENTORY

The U.S. Fish and Wildlife Services (USFWS) National Wetlands Inventory (NWI) maps an offsite Freshwater Emergent Wetland approximately 300 feet north of the study area (Figure 4). There are no wetlands mapped within the study area boundaries. ELS biologists generally agree with this mapping due to lack of evidence of wetland characteristics on site.

KITSAP COUNTY CRITICAL AREAS

The Kitsap County Critical Areas (KCCA) GIS website maps the offsite wetland north of the study area similarly to the NWI (Figure 5). The offsite wetland is over 300 feet away from the northern boundary, so the required buffers do not extend onto this property.

² Critical area maps should be used with discretion because they are used to gather general wetland information about a regional area and therefore are limited in accuracy for smaller areas because of their large scale.

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE, PRIORITY HABITATS AND SPECIES

The Washington Department of Fish and Wildlife (WDFW), Priority Habitats and Species website (PHS) maps the freshwater emergent wetland north of the study area similarly to the NWI and KCCA but does not map any other priority habitats or species on or within 300 feet of the study area (Figure 6).

CONCLUSIONS

NON-WETLAND DETERMINATION

No wetlands were identified onsite or within 300 feet of the property. ELS biologists chose to conduct Test Plots 2 through 5 in areas indicating wetland hydrology to rule out the potential of a wetland (Figure 2). Test plots were also conducted in upland areas to confirm the observed upland conditions. Although the onsite hydrology can be associated with wetlands, the data collected revealed upland soil conditions upon investigation. The data collected throughout the rest of the study area also lacked positive indicators for hydric soils and hydric vegetation.

LIMITATIONS

ELS bases this report's determinations on standard scientific methodology and best professional judgment. In our opinion, local, state, and federal regulatory agencies should agree with our determinations. However, the information contained in this report should be considered preliminary and used at your own risk until it has been reviewed and approved in writing by the appropriate regulatory agencies. ELS is not responsible for the impacts of any changes in environmental standards, practices, or regulations after the date of this report.

REFERENCES

- Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*, Technical Report Y-87-1. U.S. Army Corps of Engineer Waterways Experiment Station, Vicksburg, Mississippi.
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- U.S. Fish & Wildlife Service (USFWS). 2022. *National Wetlands Inventory*. Online document <https://www.fws.gov/wetlands/data/Mapper.html>. Website accessed July 2022.
- Washington Department of Fish and Wildlife (WDFW). 2022. Priority Habitats and Species On The Web. <http://apps.wdfw.wa.gov/phsontheweb>. Website accessed July 2022.

FIGURES & PHOTOPLATES

7/12/2022 3:07 PM C:\Users\right\Box\ELSWA\Kitsap\County\2521-Rice Fergus Miller\2521.06-Mile Hill Drive Shelter\2521.06-Figures CAD Only\2521.06_CAR.dwg right

WASHINGTON



47.5359° Latitude
-122.5924° Longitude

LOCATION MAP

R 1 W

6					1
31					36

T 1 N

PROJECT VICINITY MAP

0 52
SCALE IN MILES

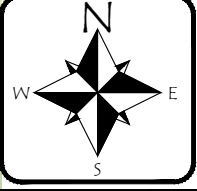
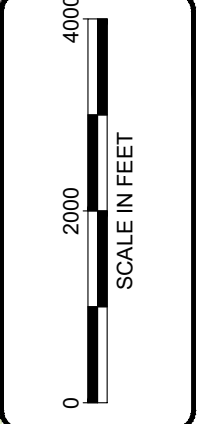


Figure 1

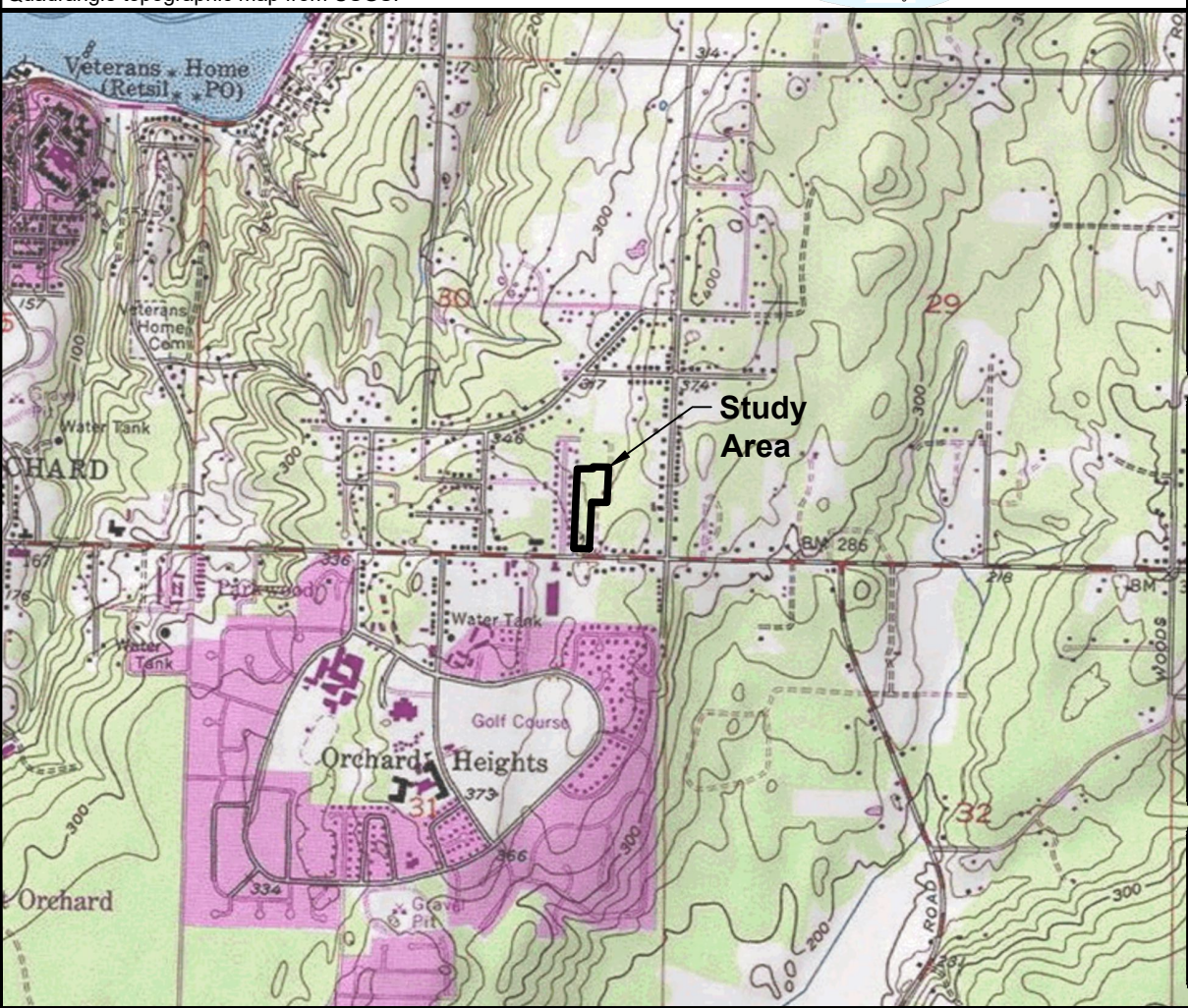
VICINITY MAP
Pacific Building Conversion
Rice Fergus Miller
Kitsap County, WA
Section 30, Township 24N, Range 2E, W.M.

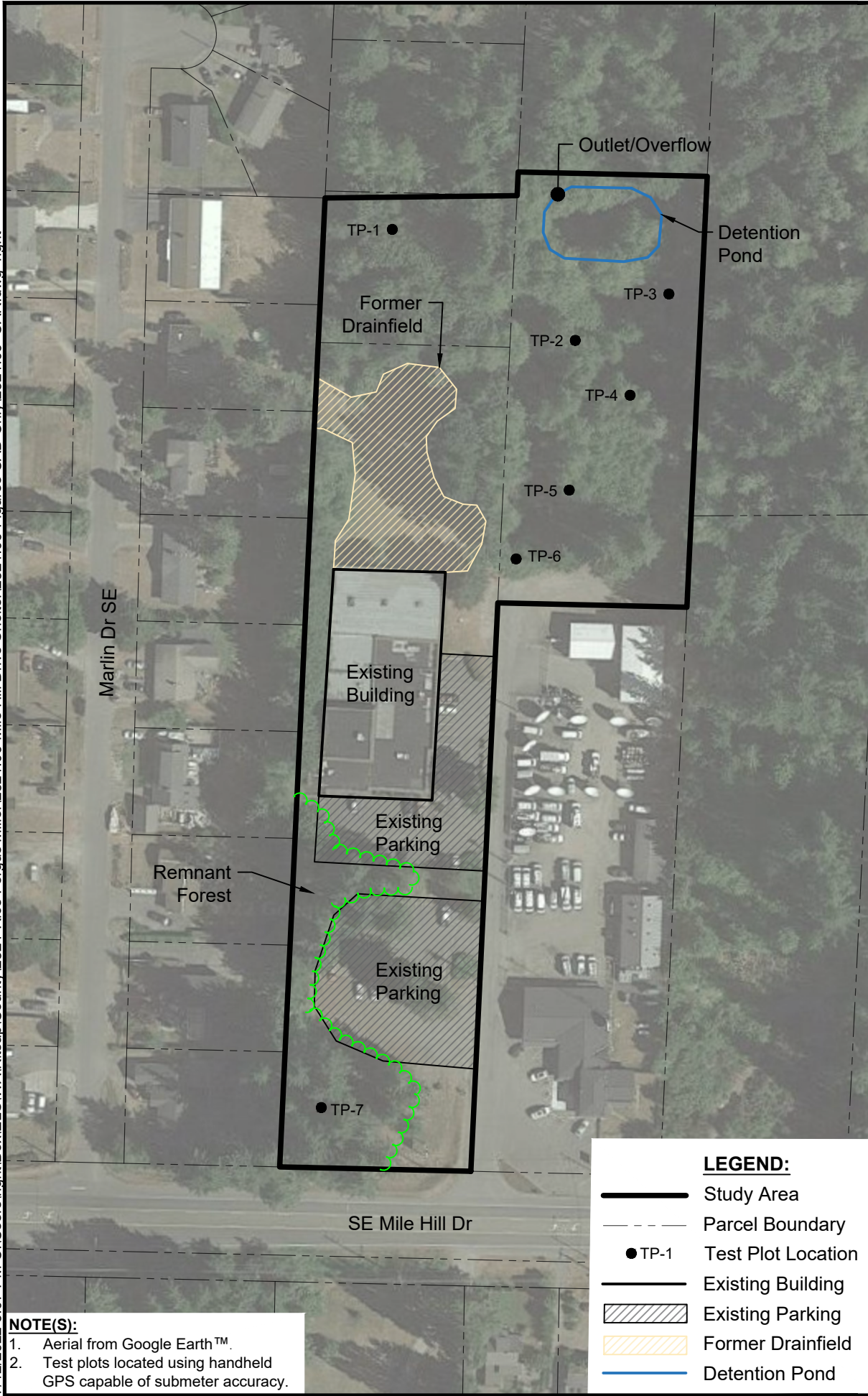
DATE: 7/12/22
DWN: EF
REQ. BY: JB
PRJ. MGR: JB
CHK:
PROJECT NO: 2521.06

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NOTE:
Quadrangle topographic map from USGS.

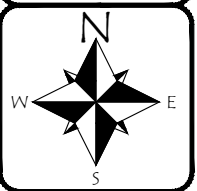
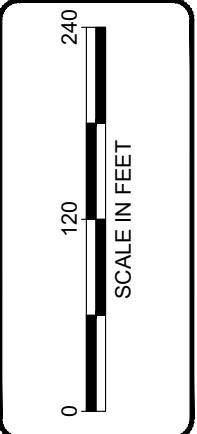




NOTE(S):
 1. Aerial from Google Earth™.
 2. Test plots located using handheld GPS capable of submeter accuracy.

LEGEND:

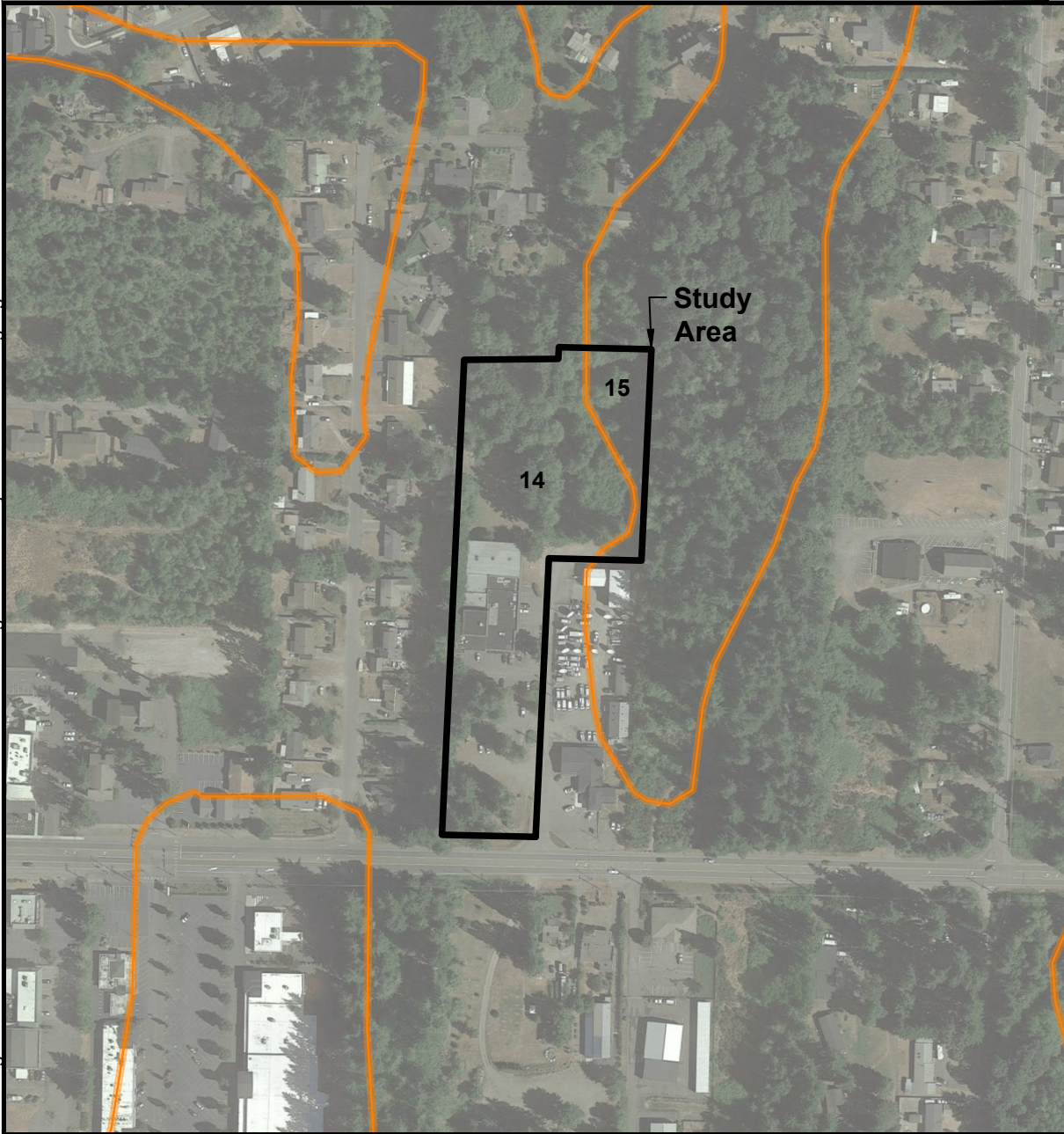
- Study Area
- Parcel Boundary
- TP-1 Test Plot Location
- Existing Building
- Existing Parking
- Former Drainfield
- Detention Pond





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Figure 2
EXISTING CONDITIONS
 Pacific Building Conversion
 Rice Fergus Miller
 Kitsap County, WA
 Section 30, Township 24N, Range 2E, W.M.

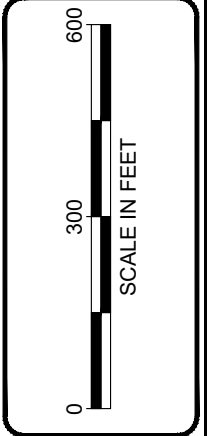


LEGEND:

-  Study Area
-  NRCS Soil Boundary
- 14** Harstine gravelly ashy sandy loam, 0 to 6 percent slopes. Not hydric.
- 15** Harstine gravelly ashy sandy loam, 6 to 15 percent slopes. Not hydric.

NOTE(S):

1. Map provided on-line by NRCS at web address:
<http://websoilsurvey.nrcs.usda.gov/app/>




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Figure 3
NRCS SOIL SURVEY
Pacific Building Conversion
Rice Fergus Miller
Kitsap County, WA
Section 30, Township 24N, Range 2E, W.M.

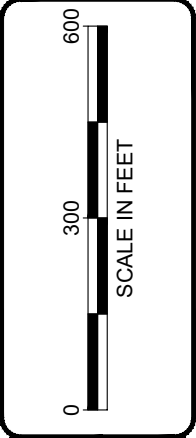


No mapped wetlands indicated onsite by US Fish & Wildlife Service.

- LEGEND:**
-  Study Area
 - Wetlands**
 -  Freshwater Emergent Wetland

NOTE(S):

1. Map provided on-line by US Fish & Wildlife Service at web address:
<https://www.fws.gov/program/national-wetlands-inventory/wetlands-mapper>




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Figure 4
USFWS NATIONAL WETLANDS INVENTORY
Pacific Building Conversion
Rice Fergus Miller
Kitsap County, WA
Section 30, Township 24N, Range 2E, W.M.

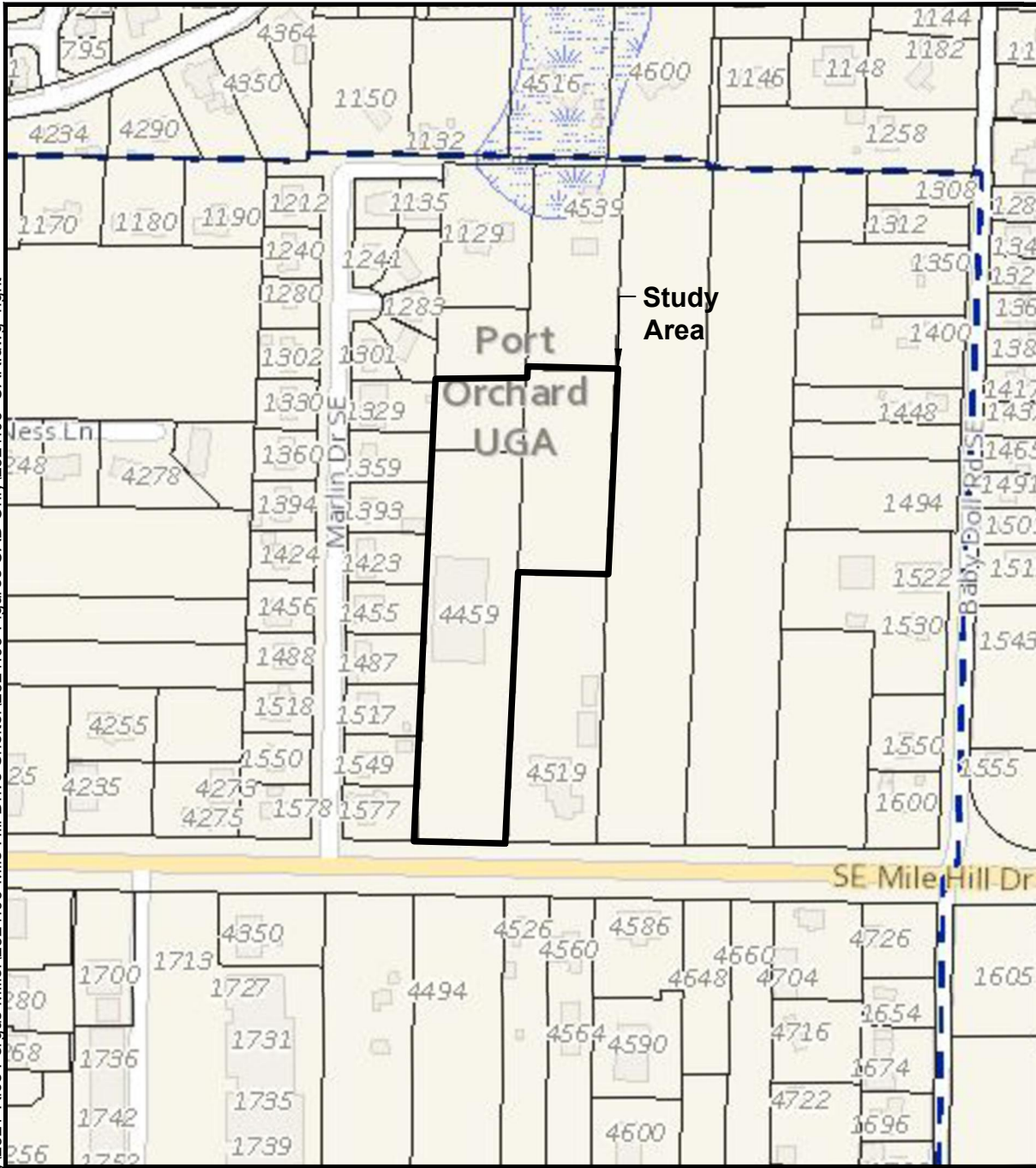
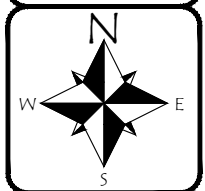
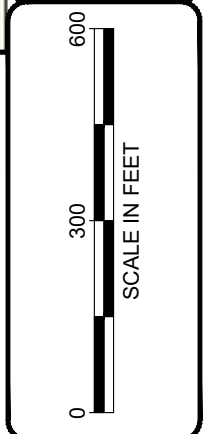


Figure 5
KITSAP COUNTY CRITICAL AREAS
 Pacific Building Conversion
 Rice Fergus Miller
 Kitsap County, WA
 Section 30, Township 24N, Range 2E, W.M.

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LEGEND:

- Study Area
- Boundary Borders**
- Military Boundary
- City Boundary
- Reservation Boundary
- UAG Boundary
- LAMIRD Boundary

- Critical Areas**
- Waterbodies**
- Includes DNR NWI and Surveyed Wetlands
- DNR NWI Surveyed Wetlands
- FEMA Flood Hazard Areas**
- 100 Year Floodplain
- Storm Induced Velocity Wave Hazard
- Hydic Soils**
- Potential Wetlands

- Geologic Critical Areas**
- Seismic High Hazard Area**
- High
- Landslide Hazard areas**
- High
- Moderate
- Erosion Hazard Area**
- High
- Moderate
- Seismic Moderate Hazard Area**
- Moderate

- Streams**
- Watercourse - DNR and Wildfish Conservancy**
- (S) Designated Shoreline of the State
- (F) Fish Habitat
- (N) Non-fish Habitat
- (U) Unknown, unmodeled hydrographic feature
- No Channel as depicted by DNR

- Bald Eagle Nests**
- Bald Eagle Management Buffers Small Scale**
- Priority 1
- Priority 2

NOTE(S):

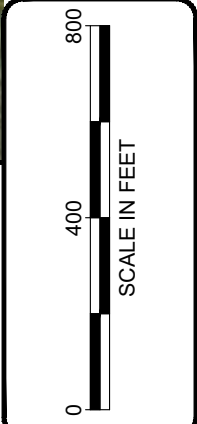
1. Map provided on-line by Kitsap County at web address: <https://psearch.kitsapgov.com/webappa/>



Study Area



LEGEND:
Freshwater Emergent Wetland



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Figure 6
WDFW PRIORITY HABITAT AND SPECIES
Pacific Building Conversion
Rice Fergus Miller
Kitsap County, WA
Section 30, Township 24N, Range 2E, W.M.

NOTE: Map provided on-line by Washington State Department of Fish & Wildlife at web address:
<http://apps.wdfw.wa.gov/phsontheweb/>



Photo 1 shows the small outlet coming out of the northwest corner of the existing detention pond.



Photo 2 was taken on the southern side of the detention pond, showing the fencing surrounding it and dense vegetation.



Photo 3 was taken where Test Plot 1 was conducted. The area was slightly sloped and did not exhibit any wetland characteristics or evidence of wetland parameters.



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**Photoplate 1
Site Photos**
Rice Fergus Miller Architect
Pacific Building Conversion
Kitsap County, WA



Photo 4 was taken of the area where Test Plot 2 was conducted which was dominated by Himalayan blackberry. While there was hydrology present, the soil profile revealed non-hydric soils and was determined as not wetland.



Photo 5 was taken in the area where Test Plot 3 was conducted. The soil was saturated and the area was dominated by FAC vegetation, but the soil profile revealed upland soils.



Photo 6 was conducted where Test Plot 4 was conducted, which was dominated by creeping buttercup. The soil profile revealed a high chroma and was determined to be not wetland.



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**Photoplate 2
Site Photos**
Rice Fergus Miller Architect
Pacific Building Conversion
Kitsap County, WA



Photo 7 was taken of the area where Test Plot 6 was conducted, which consisted of a sparse forested layer with big leaf maple and a dense shrub layer with Himalayan blackberry, salmonberry, and trailing blackberry. The area lacked hydric soils and wetland hydrology.



Photo 8 was taken of the area where Test Plot 7 was conducted, near the southwest corner of the property. The test plot revealed upland soils, absence of wetland hydrology, and the area was dominated by FACU vegetation.



Photo 9 was taken near the historic drain-field and shows where the vegetation starts increasing in density with a mix of coniferous and deciduous forested components.



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**Photoplate 3
Site Photos**
Rice Fergus Miller Architect
Pacific Building Conversion
Kitsap County, WA



Photo 10 was taken of the historic drainfield area, which was on a hill and directly behind the existing building. The vegetation was dominated by mowed grasses and weeds.



Photo 11 was taken near where Test Plot 7 was conducted, and shows the existing gravel lot on the right side of the frame.



Photo 12 was taken near the center of the property where big leaf maple and mature hazelnut trees dominated the forested layer.



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**Photoplate 4
Site Photos**
Rice Fergus Miller Architects
Pacific Building Conversion
Kitsap County, WA



Photo 13 was taken near the southeastern edge in an area with large amounts of debris.



Photo 14 was taken from the western portion of the property looking north. The existing building is visible on the right side of the photo.



Photo 15 was taken near the southeastern property boundary showing the existing parking lot and gravel area on the left side of the photo.



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**Photoplate 5
Site Photos**
Rice Fergus Miller Architect
Pacific Building Conversion
Kitsap County, WA

APPENDIX A

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: 4459 SE Mile Hill Dr City/County: Port Orchard/Kitsap Sampling Date: 6/6/2022
 Applicant/Owner: Rice Fergus Miller Architects State: WA Sampling Point: TP 1
 Investigator(s): J. Bartlett & E. Crockett Section, Township, Range: S30, T24N, R2E WM
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): convex Slope (%): 3%
 Subregion (LRR): MLRA 2 Lat: 47.321063 Long: -122.2353410 Datum: NAD83
 Soil Map Unit Name: 14-Harstine gravelly ashy sandy loam, 0 to 6 percent slopes NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Remarks: The study area is located in a commercial area of Port Orchard on the north side of Mile Hill Drive. There is an existing building and parking area on the southern portion while the northern side is mostly undeveloped aside from an existing detention pond. Test Plot 1 was conducted in a forested area in the northwest corner of the study area.					

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: 30' diameter)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:																
1. <u><i>Acer macrophyllum</i></u>	<u>10</u>	<u>yes</u>	<u>FACU</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>8</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
50% = <u>5</u> , 20% = <u>2</u>	<u>10</u>	= Total Cover																		
<u>Sapling/Shrub Stratum (Plot size: 20' diameter)</u>																				
1. <u><i>Oemleria cerasiformis</i></u>	<u>15</u>	<u>yes</u>	<u>FACU</u>	Prevalence Index worksheet: <table style="width: 100%; border: none;"> <tr> <td style="text-align: right;">Total % Cover of:</td> <td style="text-align: right;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x2 = _____</td> </tr> <tr> <td>FAC species _____</td> <td>x3 = _____</td> </tr> <tr> <td>FACU species _____</td> <td>x4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x5 = _____</td> </tr> <tr> <td>Column Totals: _____ (A)</td> <td>_____ (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = _____</td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species _____	x1 = _____	FACW species _____	x2 = _____	FAC species _____	x3 = _____	FACU species _____	x4 = _____	UPL species _____	x5 = _____	Column Totals: _____ (A)	_____ (B)	Prevalence Index = B/A = _____	
Total % Cover of:	Multiply by:																			
OBL species _____	x1 = _____																			
FACW species _____	x2 = _____																			
FAC species _____	x3 = _____																			
FACU species _____	x4 = _____																			
UPL species _____	x5 = _____																			
Column Totals: _____ (A)	_____ (B)																			
Prevalence Index = B/A = _____																				
2. <u><i>Corylus cornuta</i></u>	<u>15</u>	<u>yes</u>	<u>FACU</u>																	
3. <u><i>Holodiscus discolor</i></u>	<u>10</u>	<u>yes</u>	<u>FACU</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
50% = <u>20</u> , 20% = <u>4</u>	<u>40</u>	= Total Cover																		
<u>Herb Stratum (Plot size: 10' diameter)</u>																				
1. <u><i>Dicentra formosa</i></u>	<u>10</u>	<u>yes</u>	<u>FACU</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 – Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
2. <u><i>Polystichum munitum</i></u>	<u>10</u>	<u>yes</u>	<u>FACU</u>																	
3. <u><i>Pteridium aquilinum</i></u>	<u>10</u>	<u>yes</u>	<u>FACU</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
50% = <u>15</u> , 20% = <u>6</u>	<u>30</u>	= Total Cover																		
<u>Woody Vine Stratum (Plot size: 20' diameter)</u>																				
1. <u><i>Rubus ursinus</i></u>	<u>20</u>	<u>yes</u>	<u>FACU</u>	Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>																
2. _____	_____	_____	_____																	
50% = <u>10</u> , 20% = <u>4</u>	<u>20</u>	= Total Cover																		
% Bare Ground in Herb Stratum <u>70</u>																				

Remarks: The hydrophytic vegetation criterion is not met because there is less than 50% dominance by FAC species.

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 2/1	100	_____	_____	_____	_____	gr lo	_____
4-10	10YR 3/2	100	_____	_____	_____	_____	gr sa lo	_____
10-16	10YR 4/3	100	_____	_____	_____	_____	gr sa lo	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	sa - sandy
_____	_____	_____	_____	_____	_____	_____	_____	gr - gravelly
_____	_____	_____	_____	_____	_____	_____	_____	lo - loam

¹Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC=Root Channel

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Stripped Matrix (S6)
- Loamy Mucky Mineral (F1) **(except MLRA 1)**
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____
 Depth (inches): _____

Hydric Soils Present? Yes No

Remarks: The soil profile does not meet hydric soil indicators because the matrix chroma is too high.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Surface Soil Cracks (B6)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- Salt Crust (B11)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Stunted or Stresses Plants (D1) **(LRR A)**
- Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- FAC-Neutral Test (D5)
- Raised Ant Mounds (D6) **(LRR A)**
- Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes No Depth (inches): _____
 Water Table Present? Yes No Depth (inches): _____
 Saturation Present? (includes capillary fringe) Yes No Depth (inches): _____

Wetland Hydrology Present? Yes No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No hydrology present and there was no evidence of wetland hydrology.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: 4459 SE Mile Hill Dr City/County: Port Orchard/Kitsap Sampling Date: 6/6/2022
 Applicant/Owner: Rice Fergus Miller Architects State: WA Sampling Point: TP 2
 Investigator(s): J. Bartlett & E. Crockett Section, Township, Range: S30, T24N, R2E WM
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): convex Slope (%): 3%
 Subregion (LRR): MLRA 2 Lat: 47.321036 Long: -122.353291 Datum: NAD83
 Soil Map Unit Name: 15-Harstine gravelly ashy sandy loam, 6 to 15 percent slopes NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland?		
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>			
Remarks: The study area is located in a commercial area of Port Orchard on the north side of Mile Hill Drive. There is an existing building and parking area on the southern portion while the northern side is mostly undeveloped aside from an existing detention pond. Test Plot 2 was conducted just south of the existing detention pond.					

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: 30' diameter)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:																
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80</u> (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
50% = _____, 20% = _____	_____	= Total Cover		Prevalence Index worksheet: <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;"><u>Total % Cover of:</u></td> <td style="text-align: center;"><u>Multiply by:</u></td> </tr> <tr> <td>OBL species _____</td> <td>x1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x2 = _____</td> </tr> <tr> <td>FAC species _____</td> <td>x3 = _____</td> </tr> <tr> <td>FACU species _____</td> <td>x4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x5 = _____</td> </tr> <tr> <td>Column Totals: _____ (A)</td> <td>_____ (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = _____</td> </tr> </table>	<u>Total % Cover of:</u>	<u>Multiply by:</u>	OBL species _____	x1 = _____	FACW species _____	x2 = _____	FAC species _____	x3 = _____	FACU species _____	x4 = _____	UPL species _____	x5 = _____	Column Totals: _____ (A)	_____ (B)	Prevalence Index = B/A = _____	
<u>Total % Cover of:</u>	<u>Multiply by:</u>																			
OBL species _____	x1 = _____																			
FACW species _____	x2 = _____																			
FAC species _____	x3 = _____																			
FACU species _____	x4 = _____																			
UPL species _____	x5 = _____																			
Column Totals: _____ (A)	_____ (B)																			
Prevalence Index = B/A = _____																				
<u>Sapling/Shrub Stratum (Plot size: 20' diameter)</u>																				
1. <u>Rubus spectabilis</u>	<u>25</u>	<u>yes</u>	<u>FAC</u>																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
50% = <u>12.5</u> , 20% = <u>5</u>	<u>25</u>	= Total Cover																		
<u>Herb Stratum (Plot size: 10' diameter)</u>																				
1. <u>Equisetum arvense</u>	<u>10</u>	<u>yes</u>	<u>FAC</u>																	
2. <u>Athyrium cyclosoorum</u>	<u>5</u>	<u>yes</u>	<u>FAC</u>																	
3. <u>Polystichum munitum</u>	<u>5</u>	<u>yes</u>	<u>FACU</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
50% = <u>10</u> , 20% = <u>4</u>	<u>20</u>	= Total Cover																		
<u>Woody Vine Stratum (Plot size: 20' diameter)</u>																				
1. <u>Rubus armeniacus</u>	<u>75</u>	<u>yes</u>	<u>FAC</u>																	
2. _____	_____	_____	_____																	
50% = <u>37.5</u> , 20% = <u>15</u>	<u>75</u>	= Total Cover																		
% Bare Ground in Herb Stratum <u>80</u>																				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																				

Remarks: The hydrophytic vegetation criterion is met because there is greater than 50% dominance by FAC species.

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-5	10YR 3/2	100	_____	_____	_____	_____	sa lo	_____
5-16	10YR 3/2	49	10YR 4/6	1	C	M	sa lo	mixed matrix
5-16	10YR 3/1	50	_____	_____	_____	_____	sa lo	mixed matrix
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	sa - sandy
_____	_____	_____	_____	_____	_____	_____	_____	lo - loam

¹Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC=Root Channel

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Loamy Mucky Mineral (F1) **(except MLRA 1)**
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____
 Depth (inches): _____

Hydric Soils Present? Yes No

Remarks: The soil profile does not meet hydric soil indicators because the matrix chroma is too high.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Surface Soil Cracks (B6)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- Salt Crust (B11)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Stunted or Stresses Plants (D1) **(LRR A)**
- Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- FAC-Neutral Test (D5)
- Raised Ant Mounds (D6) **(LRR A)**
- Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes No Depth (inches): _____
 Water Table Present? Yes No Depth (inches): 16
 Saturation Present? (includes capillary fringe) Yes No Depth (inches): 5

Wetland Hydrology Present? Yes No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Primary wetland hydrology indicator Saturation (A3) was present at 5 inches. A water table was present at 16 inches, which is too low to be considered wetland hydrology.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: 4459 SE Mile Hill Dr City/County: Port Orchard/Kitsap Sampling Date: 6/6/2022
 Applicant/Owner: Rice Fergus Miller Architects State: WA Sampling Point: TP 3
 Investigator(s): J. Bartlett & E. Crockett Section, Township, Range: S30, T24N, R2E WM
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): convex Slope (%): 3%
 Subregion (LRR): MLRA 2 Lat: 47.32999 Long: -122.353096 Datum: NAD83
 Soil Map Unit Name: 15-Harstine gravelly ashy sandy loam, 6 to 15 percent slopes NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland?		
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>			
Remarks: The study area is located in a commercial area of Port Orchard on the north side of Mile Hill Drive. There is an existing building and parking area on the southern portion while the northern side is mostly undeveloped aside from an existing detention pond. Test Plot 3 was conducted on the east side of the study area in a low area. The soil appeared to be disturbed by prior development.					

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: 30' diameter)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:																
1. <u><i>Alnus rubra</i></u>	<u>10</u>	<u>yes</u>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>83.3</u> (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
50% = <u>5</u> , 20% = <u>2</u>	_____	= Total Cover																		
<u>Sapling/Shrub Stratum (Plot size: 20' diameter)</u>				Prevalence Index worksheet: <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;"><u>Total % Cover of:</u></td> <td style="text-align: center;"><u>Multiply by:</u></td> </tr> <tr> <td>OBL species _____</td> <td>x1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x2 = _____</td> </tr> <tr> <td>FAC species _____</td> <td>x3 = _____</td> </tr> <tr> <td>FACU species _____</td> <td>x4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x5 = _____</td> </tr> <tr> <td>Column Totals: _____ (A)</td> <td>_____ (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = _____</td> </tr> </table>	<u>Total % Cover of:</u>	<u>Multiply by:</u>	OBL species _____	x1 = _____	FACW species _____	x2 = _____	FAC species _____	x3 = _____	FACU species _____	x4 = _____	UPL species _____	x5 = _____	Column Totals: _____ (A)	_____ (B)	Prevalence Index = B/A = _____	
<u>Total % Cover of:</u>	<u>Multiply by:</u>																			
OBL species _____	x1 = _____																			
FACW species _____	x2 = _____																			
FAC species _____	x3 = _____																			
FACU species _____	x4 = _____																			
UPL species _____	x5 = _____																			
Column Totals: _____ (A)	_____ (B)																			
Prevalence Index = B/A = _____																				
1. <u><i>Alnus rubra</i> (saplings)</u>	<u>20</u>	<u>yes</u>	<u>FAC</u>																	
2. <u><i>Ilex aquifolium</i></u>	<u>5</u>	<u>yes</u>	<u>FACU</u>																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
50% = <u>12.5</u> , 20% = <u>5</u>	<u>25</u>	= Total Cover																		
<u>Herb Stratum (Plot size: 10' diameter)</u>				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 – Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
1. <u><i>Equisetum arvense</i></u>	<u>50</u>	<u>yes</u>	<u>FAC</u>																	
2. <u><i>Ranunculus repens</i></u>	<u>50</u>	<u>yes</u>	<u>FAC</u>																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
50% = <u>50</u> , 20% = <u>10</u>	<u>100</u>	= Total Cover																		
<u>Woody Vine Stratum (Plot size: 20' diameter)</u>				Hydrophytic Vegetation Present? <table style="width: 100%; border: none;"> <tr> <td style="width: 60%;"></td> <td style="text-align: center;">Yes</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;">No</td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table>		Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>											
	Yes	<input checked="" type="checkbox"/>	No		<input type="checkbox"/>															
1. <u><i>Rubus armeniacus</i></u>	<u>15</u>	<u>yes</u>	<u>FAC</u>																	
2. _____	_____	_____	_____																	
50% = <u>7.5</u> , 20% = <u>3</u>	<u>15</u>	= Total Cover																		
% Bare Ground in Herb Stratum <u>0</u>																				

Remarks: **The hydrophytic vegetation criterion is met because there is greater than 50% dominance by FAC species.**

SOIL

Sampling Point: TP 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10YR 3/2	100					sa lo	
6-10	10YR 5/2	90	10YR 4/6	10	C	M	cl lo	disturbed soil with burned wood and debris
10-16	10YR 2/1	100					sa lo	
								sa - sandy
								lo - loam

¹Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC=Root Channel

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils³:	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input checked="" type="checkbox"/> Depleted Matrix (F3)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)		

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):	Hydric Soils Present?	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
Type: _____					
Depth (inches): _____					

Remarks: The second layer in the soil profile meets hydric soil indicator Depleted Matrix (F3) because of the depleted matrix and presence of redoximorphic features, but has been disturbed and has inconsistent soil horizons, so the area was determined to not meet the hydric soil criterion.

HYDROLOGY

Wetland Hydrology Indicators:
 Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (2 or more required)

<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Water-Stained Leaves (B9)
<input checked="" type="checkbox"/> High Water Table (A2)	(except MLRA 1, 2, 4A, and 4B)	(MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Stunted or Stresses Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

Field Observations:	Wetland Hydrology Present?	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____				
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>12</u>				
Saturation Present? (includes capillary fringe) Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____				

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Primary wetland hydrology indicator High Water Table (A2) was present at 12 inches.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: 4459 SE Mile Hill Dr City/County: Port Orchard/Kitsap Sampling Date: 6/6/2022
 Applicant/Owner: Rice Fergus Miller Architects State: WA Sampling Point: TP 4
 Investigator(s): J. Bartlett & E. Crockett Section, Township, Range: S30, T24N, R2E WM
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): convex Slope (%): 2%
 Subregion (LRR): MLRA 2 Lat: 47.32944 Long: -122.353201 Datum: NAD83
 Soil Map Unit Name: 15-Harstine gravelly ashy sandy loam, 6 to 15 percent slopes NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Remarks: The study area is located in a commercial area of Port Orchard on the north side of Mile Hill Drive. There is an existing building and parking area on the southern portion while the northern side is mostly undeveloped aside from an existing detention pond. Test Plot 4 was conducted central to the eastern portion in an area that was potentially an old building site and dominated by creeping buttercup.					

VEGETATION – Use scientific names of plants

<u>Tree Stratum</u> (Plot size: <u>30'</u> diameter)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:																									
1. <u><i>Alnus rubra</i></u>	<u>20</u>	<u>yes</u>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)																									
2. _____	_____	_____	_____																										
3. _____	_____	_____	_____																										
4. _____	_____	_____	_____																										
50% = <u>10</u> , 20% = <u>4</u>	<u>20</u>	= Total Cover																											
<u>Sapling/Shrub Stratum</u> (Plot size: <u>20'</u> diameter)				Prevalence Index worksheet:																									
1. <u><i>Rubus spectabilis</i></u>	<u>10</u>	<u>yes</u>	<u>FAC</u>		<table style="width: 100%; border: none;"> <tr> <td colspan="2" style="text-align: center;"><u>Total % Cover of:</u></td> <td style="text-align: center;"><u>Multiply by:</u></td> </tr> <tr> <td>OBL species</td> <td>_____</td> <td>x1 = _____</td> </tr> <tr> <td>FACW species</td> <td>_____</td> <td>x2 = _____</td> </tr> <tr> <td>FAC species</td> <td>_____</td> <td>x3 = _____</td> </tr> <tr> <td>FACU species</td> <td>_____</td> <td>x4 = _____</td> </tr> <tr> <td>UPL species</td> <td>_____</td> <td>x5 = _____</td> </tr> <tr> <td>Column Totals:</td> <td>_____ (A)</td> <td>_____ (B)</td> </tr> <tr> <td colspan="3" style="text-align: center;">Prevalence Index = B/A = _____</td> </tr> </table>	<u>Total % Cover of:</u>		<u>Multiply by:</u>	OBL species	_____	x1 = _____	FACW species	_____	x2 = _____	FAC species	_____	x3 = _____	FACU species	_____	x4 = _____	UPL species	_____	x5 = _____	Column Totals:	_____ (A)	_____ (B)	Prevalence Index = B/A = _____		
<u>Total % Cover of:</u>		<u>Multiply by:</u>																											
OBL species	_____	x1 = _____																											
FACW species	_____	x2 = _____																											
FAC species	_____	x3 = _____																											
FACU species	_____	x4 = _____																											
UPL species	_____	x5 = _____																											
Column Totals:	_____ (A)	_____ (B)																											
Prevalence Index = B/A = _____																													
2. _____	_____	_____	_____																										
3. _____	_____	_____	_____																										
4. _____	_____	_____	_____																										
5. _____	_____	_____	_____																										
50% = <u>5</u> , 20% = <u>2</u>	<u>10</u>	= Total Cover																											
<u>Herb Stratum</u> (Plot size: <u>10'</u> diameter)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 – Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																									
1. <u><i>Ranunculus repens</i></u>	<u>50</u>	<u>yes</u>	<u>FAC</u>																										
2. _____	_____	_____	_____																										
3. _____	_____	_____	_____																										
4. _____	_____	_____	_____																										
5. _____	_____	_____	_____																										
6. _____	_____	_____	_____																										
7. _____	_____	_____	_____																										
8. _____	_____	_____	_____																										
9. _____	_____	_____	_____																										
10. _____	_____	_____	_____																										
11. _____	_____	_____	_____																										
50% = <u>25</u> , 20% = <u>10</u>	<u>50</u>	= Total Cover																											
<u>Woody Vine Stratum</u> (Plot size: <u>20'</u> diameter)				Hydrophytic Vegetation Present? <table style="width: 100%; border: none;"> <tr> <td style="width: 60%;"></td> <td style="width: 10%;">Yes</td> <td style="width: 10%;"><input checked="" type="checkbox"/></td> <td style="width: 10%;">No</td> <td style="width: 10%;"><input type="checkbox"/></td> </tr> </table>		Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>																				
	Yes	<input checked="" type="checkbox"/>	No		<input type="checkbox"/>																								
1. <u><i>Rubus armeniacus</i></u>	<u>30</u>	<u>yes</u>	<u>FAC</u>																										
2. _____	_____	_____	_____																										
50% = <u>15</u> , 20% = <u>6</u>	<u>30</u>	= Total Cover																											
% Bare Ground in Herb Stratum <u>50</u>																													

Remarks: **The hydrophytic vegetation criterion is met because there is greater than 50% dominance by FAC species.**

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10YR 3/1	100	_____	_____	_____	_____	sa lo	_____
6-10	10YR 3/2	100	_____	_____	_____	_____	gr sa lo	charcoal chunks present
10-16	10YR 4/2	99	10YR 3/6	1	C	M	sa lo	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	gr - gravelly
_____	_____	_____	_____	_____	_____	_____	_____	sa - sandy
_____	_____	_____	_____	_____	_____	_____	_____	lo - loam

¹Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC=Root Channel

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Stripped Matrix (S6)
- Loamy Mucky Mineral (F1) **(except MLRA 1)**
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____
Depth (inches): _____

Hydric Soils Present? Yes No

Remarks: The soil profile does not meet hydric soil indicators because the matrix chroma is too high and the amount of redoximorphic features is less than 2 percent.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Surface Soil Cracks (B6)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

- Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- Salt Crust (B11)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Stunted or Stresses Plants (D1) **(LRR A)**
- Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- FAC-Neutral Test (D5)
- Raised Ant Mounds (D6) **(LRR A)**
- Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes No Depth (inches): _____
 Water Table Present? Yes No Depth (inches): 10
 Saturation Present? (includes capillary fringe) Yes No Depth (inches): _____

Wetland Hydrology Present? Yes No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Primary wetland hydrology indicator High Water Table (A2) was present at 10 inches, but the area seemed to be disturbed by previous development and contained earthworms in the soil profile.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: 4459 SE Mile Hill Dr City/County: Port Orchard/Kitsap Sampling Date: 6/6/2022
 Applicant/Owner: Rice Fergus Miller Architects State: WA Sampling Point: TP 5
 Investigator(s): J. Bartlett & E. Crockett Section, Township, Range: S30, T24N, R2E WM
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): convex Slope (%): 3%
 Subregion (LRR): MLRA 2 Lat: 47.32909 Long: -122.353267 Datum: NAD83
 Soil Map Unit Name: 14-Harstine gravelly ashy sandy loam, 0 to 6 percent slopes NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland?		
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>			
Remarks: The study area is located in a commercial area of Port Orchard on the north side of Mile Hill Drive. There is an existing building and parking area on the southern portion while the northern side is mostly undeveloped aside from an existing detention pond. Test Plot 5 was conducted in a sloping swale towards the middle of the study area.					

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: 30' diameter)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:																
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
50% = _____, 20% = _____	_____	= Total Cover		Prevalence Index worksheet: <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;"><u>Total % Cover of:</u></td> <td style="text-align: center;"><u>Multiply by:</u></td> </tr> <tr> <td>OBL species _____</td> <td>x1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x2 = _____</td> </tr> <tr> <td>FAC species _____</td> <td>x3 = _____</td> </tr> <tr> <td>FACU species _____</td> <td>x4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x5 = _____</td> </tr> <tr> <td>Column Totals: _____ (A)</td> <td>_____ (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = _____</td> </tr> </table>	<u>Total % Cover of:</u>	<u>Multiply by:</u>	OBL species _____	x1 = _____	FACW species _____	x2 = _____	FAC species _____	x3 = _____	FACU species _____	x4 = _____	UPL species _____	x5 = _____	Column Totals: _____ (A)	_____ (B)	Prevalence Index = B/A = _____	
<u>Total % Cover of:</u>	<u>Multiply by:</u>																			
OBL species _____	x1 = _____																			
FACW species _____	x2 = _____																			
FAC species _____	x3 = _____																			
FACU species _____	x4 = _____																			
UPL species _____	x5 = _____																			
Column Totals: _____ (A)	_____ (B)																			
Prevalence Index = B/A = _____																				
Sapling/Shrub Stratum (Plot size: 20' diameter)																				
1. <u>Rubus spectabilis</u>	<u>10</u>	<u>yes</u>	<u>FAC</u>																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
50% = <u>5</u> , 20% = <u>2</u>	<u>10</u>	= Total Cover																		
Herb Stratum (Plot size: 10' diameter)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
50% = _____, 20% = _____	_____	= Total Cover																		
Woody Vine Stratum (Plot size: 20' diameter)																				
1. <u>Rubus armeniacus</u>	<u>90</u>	<u>yes</u>	<u>FAC</u>																	
2. _____	_____	_____	_____																	
50% = <u>25</u> , 20% = <u>10</u>	<u>50</u>	= Total Cover																		
% Bare Ground in Herb Stratum <u>100</u>																				
Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 – Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																				

Remarks: The hydrophytic vegetation criterion is met because there is greater than 50% dominance by FAC species.

SOIL

Sampling Point: TP 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12	10YR 3/1	100	_____	_____	_____	_____	sa lo	_____
12-16	10YR 3/2	50	_____	_____	_____	_____	sa lo	mixed matrix
12-16	10YR 4/2	50	_____	_____	_____	_____	sa lo	mixed matrix
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	sa - sandy
_____	_____	_____	_____	_____	_____	_____	_____	lo - loam

¹Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC=Root Channel

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Loamy Mucky Mineral (F1) **(except MLRA 1)**
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____
 Depth (inches): _____

Hydric Soils Present? Yes No

Remarks: The soil profile does not meet hydric soil indicators because the matrix chroma is too high.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Surface Soil Cracks (B6)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- Salt Crust (B11)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Stunted or Stresses Plants (D1) **(LRR A)**
- Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- FAC-Neutral Test (D5)
- Raised Ant Mounds (D6) **(LRR A)**
- Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes No Depth (inches): _____
 Water Table Present? Yes No Depth (inches): 12
 Saturation Present? (includes capillary fringe) Yes No Depth (inches): 5

Wetland Hydrology Present? Yes No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Primary wetland hydrology indicators High Water Table (A2) and Saturation (A3) were present.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: 4459 SE Mile Hill Dr City/County: Port Orchard/Kitsap Sampling Date: 6/6/2022
 Applicant/Owner: Rice Fergus Miller Architects State: WA Sampling Point: TP 6
 Investigator(s): J. Bartlett & E. Crockett Section, Township, Range: S30, T24N, R2E WM
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): convex Slope (%): 3%
 Subregion (LRR): MLRA 2 Lat: 47.32836 Long: -122.353238 Datum: NAD83
 Soil Map Unit Name: 14-Harstine gravelly ashy sandy loam, 0 to 6 percent slopes NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland?		
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>			
Remarks: The study area is located in a commercial area of Port Orchard on the north side of Mile Hill Drive. There is an existing building and parking area on the southern portion while the northern side is mostly undeveloped aside from an existing detention pond. Test Plot 6 was conducted at the south end of the eastern portion of the study area.					

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: 30' diameter)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:																
1. <u><i>Acer macrophyllum</i></u>	<u>10</u>	<u>yes</u>	<u>FACU</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>66.6</u> (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
50% = <u>5</u> , 20% = <u>2</u>	<u>10</u>	= Total Cover																		
<u>Sapling/Shrub Stratum (Plot size: 20' diameter)</u>				Prevalence Index worksheet: <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;"><u>Total % Cover of:</u></td> <td style="text-align: center;"><u>Multiply by:</u></td> </tr> <tr> <td>OBL species _____</td> <td>x1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x2 = _____</td> </tr> <tr> <td>FAC species _____</td> <td>x3 = _____</td> </tr> <tr> <td>FACU species _____</td> <td>x4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x5 = _____</td> </tr> <tr> <td>Column Totals: _____ (A)</td> <td>_____ (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = _____</td> </tr> </table>	<u>Total % Cover of:</u>	<u>Multiply by:</u>	OBL species _____	x1 = _____	FACW species _____	x2 = _____	FAC species _____	x3 = _____	FACU species _____	x4 = _____	UPL species _____	x5 = _____	Column Totals: _____ (A)	_____ (B)	Prevalence Index = B/A = _____	
<u>Total % Cover of:</u>	<u>Multiply by:</u>																			
OBL species _____	x1 = _____																			
FACW species _____	x2 = _____																			
FAC species _____	x3 = _____																			
FACU species _____	x4 = _____																			
UPL species _____	x5 = _____																			
Column Totals: _____ (A)	_____ (B)																			
Prevalence Index = B/A = _____																				
1. <u><i>Rubus spectabilis</i></u>	<u>50</u>	<u>yes</u>	<u>FAC</u>																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
50% = <u>5</u> , 20% = <u>2</u>	<u>10</u>	= Total Cover																		
<u>Herb Stratum (Plot size: 10' diameter)</u>				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 – Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
50% = _____, 20% = _____	_____	= Total Cover																		
<u>Woody Vine Stratum (Plot size: 20' diameter)</u>				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																
1. <u><i>Rubus armeniacus</i></u>	<u>50</u>	<u>yes</u>	<u>FAC</u>																	
2. <u><i>Rubus ursinus</i></u>	<u>10</u>	<u>no</u>	<u>FACU</u>																	
50% = <u>30</u> , 20% = <u>12</u>	<u>60</u>	= Total Cover																		
% Bare Ground in Herb Stratum <u>100</u>																				

Remarks: The hydrophytic vegetation criterion is met because there is greater than 50% dominance by FAC species.

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-5	10YR 2/2	100	_____	_____	_____	_____	loam	_____
5-12	10YR 3/2	100	_____	_____	_____	_____	loam	_____
12-16	10YR 4/2	50	_____	_____	_____	_____	loam	mixed matrix
12-16	10YR 3/2	50	_____	_____	_____	_____	loam	mixed matrix
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

¹Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC=Root Channel

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Loamy Mucky Mineral (F1) **(except MLRA 1)**
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____
 Depth (inches): _____

Hydric Soils Present? Yes No

Remarks: The soil profile does not meet hydric soil indicators because the matrix chroma is too high.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Surface Soil Cracks (B6)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- Salt Crust (B11)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Stunted or Stresses Plants (D1) **(LRR A)**
- Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- FAC-Neutral Test (D5)
- Raised Ant Mounds (D6) **(LRR A)**
- Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes No Depth (inches): _____
 Water Table Present? Yes No Depth (inches): _____
 Saturation Present? (includes capillary fringe) Yes No Depth (inches): _____

Wetland Hydrology Present? Yes No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No hydrology was present or evidence of wetland hydrology.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: 4459 SE Mile Hill Dr City/County: Port Orchard/Kitsap Sampling Date: 6/6/2022
 Applicant/Owner: Rice Fergus Miller Architects State: WA Sampling Point: TP 7
 Investigator(s): J. Bartlett & E. Crockett Section, Township, Range: S30, T24N, R2E WM
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): convex Slope (%): 3%
 Subregion (LRR): MLRA 2 Lat: 47.32314 Long: -122.353494 Datum: NAD83
 Soil Map Unit Name: 14-Harstine gravelly ashy sandy loam, 0 to 6 percent slopes NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Remarks: The study area is located in a commercial area of Port Orchard on the north side of Mile Hill Drive. There is an existing building and parking area on the southern portion while the northern side is mostly undeveloped aside from an existing detention pond. Test Plot 7 was conducted near the south end of the study area.					

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: 30' diameter)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:																
1. <i>Pseudotsuga menziesii</i>	25	yes	FACU	Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
50% = <u>12.5</u> , 20% = <u>5</u>	<u>25</u>	= Total Cover																		
Sapling/Shrub Stratum (Plot size: 20' diameter)				Prevalence Index worksheet: <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; text-align: center;"><u>Total % Cover of:</u></td> <td style="width: 50%; text-align: center;"><u>Multiply by:</u></td> </tr> <tr> <td>OBL species _____</td> <td>x1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x2 = _____</td> </tr> <tr> <td>FAC species _____</td> <td>x3 = _____</td> </tr> <tr> <td>FACU species _____</td> <td>x4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x5 = _____</td> </tr> <tr> <td>Column Totals: _____ (A)</td> <td>_____ (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = _____</td> </tr> </table>	<u>Total % Cover of:</u>	<u>Multiply by:</u>	OBL species _____	x1 = _____	FACW species _____	x2 = _____	FAC species _____	x3 = _____	FACU species _____	x4 = _____	UPL species _____	x5 = _____	Column Totals: _____ (A)	_____ (B)	Prevalence Index = B/A = _____	
<u>Total % Cover of:</u>	<u>Multiply by:</u>																			
OBL species _____	x1 = _____																			
FACW species _____	x2 = _____																			
FAC species _____	x3 = _____																			
FACU species _____	x4 = _____																			
UPL species _____	x5 = _____																			
Column Totals: _____ (A)	_____ (B)																			
Prevalence Index = B/A = _____																				
1. <i>Mahonia nervosa</i>	10	yes	FACU																	
2. <i>Gaultheria shallon</i>	5	yes	FACU																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
50% = <u>7.5</u> , 20% = <u>3</u>	<u>15</u>	= Total Cover																		
Herb Stratum (Plot size: 10' diameter)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 – Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
1. <i>Lapsana communis</i>	25	yes	FACU																	
2. <i>Hypochaeris radicata</i>	20	yes	FACU																	
3. <i>Dactylis glomerata</i>	15	no	FACU																	
4. <i>Pteridium aquilinum</i>	15	no	FACU																	
5. <i>Linnaea borealis</i>	10	no	FACU																	
6. <i>Trientalis borealis</i>	10	no	FAC																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
50% = <u>47.5</u> , 20% = <u>18</u>	<u>95</u>	= Total Cover																		
Woody Vine Stratum (Plot size: 20' diameter)				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>																
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
50% = _____, 20% = _____	_____	= Total Cover																		
% Bare Ground in Herb Stratum <u>5</u>																				

Remarks: The hydrophytic vegetation criterion is not met because there is less than 50% dominance by FAC species.

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 3/2	100	_____	_____	_____	_____	v gr lo	_____
4-16	10YR 5/3	33	_____	_____	_____	_____	v gr sa lo	mixed matrix
4-16	10YR 4/4	33	_____	_____	_____	_____	v gr sa lo	mixed matrix
12-16	10YR 3/3	33	10YR 4/6	1	C	M	v gr sa lo	mixed matrix
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

¹Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix, RC=Root Channel

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Loamy Mucky Mineral (F1) **(except MLRA 1)**
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____
 Depth (inches): _____

Hydric Soils Present? Yes No

Remarks: The soil profile does not meet hydric soil indicators because the matrix chroma is too high.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Surface Soil Cracks (B6)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- Salt Crust (B11)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres along Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Stunted or Stresses Plants (D1) **(LRR A)**
- Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- FAC-Neutral Test (D5)
- Raised Ant Mounds (D6) **(LRR A)**
- Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes No Depth (inches): _____
 Water Table Present? Yes No Depth (inches): _____
 Saturation Present? (includes capillary fringe) Yes No Depth (inches): _____

Wetland Hydrology Present? Yes No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No hydrology was present and there was no evidence of wetland hydrology.

Asbestos, Lead, and Hazardous Building Materials Survey

Mile Hill Health Club
4459 Southeast Mile Hill Drive, Port Orchard, Washington

Prepared for: Kitsap County Commissioner's Office
619 Division Street, 4th Floor, Port Orchard, Washington

August 16, 2021

Project Number 21-07003



Environmental Scientists, Planners and Consultants

800 5th Ave., Suite 101-313
Seattle, WA 98104
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www.ecocompliance.biz
DirtyProperty.com

Executive Summary

Eco Compliance Corporation was contracted by Kitsap County Commissioner's Office (the Client) to perform a Hazardous Building Material Survey of the Mile Hill Health club property located at 4459 Southeast Mile Hill Drive, Port Orchard, Washington (the Subject Property). The Subject Property is identified on Figure 1. The survey was conducted on July 26, 2021. Future plans call for the renovation of this structure. The purpose of this investigation was to identify asbestos-containing materials (ACM) and Lead-Based Paint (LBP) within the building. The building was also evaluated for other potentially hazardous building materials such as lead, mercury-containing thermostats, Polychlorinated Biphenyl (PCB) containing light ballasts and fuel storage tanks.

The subject building is a two-story structure. The building size is approximately 20,040 square feet wood frame structure with a concrete slab-on-grade foundation. Interior building materials consist of typical concrete and metal. Lighting is provided by fluorescent fixtures. The results of the survey are briefly summarized below.

Asbestos

Overall, a total of 53 samples were collected from the subject building and analyzed for asbestos content. There was no asbestos detected in any of these samples. No further action or investigation is necessary in regards to asbestos containing materials.

Lead

A total of eight paint samples were collected from the interior of the subject building and analyzed for total lead content. From these samples, lead was detected in the following at concentrations above the L&I threshold but not the EPA/HUD standard.

- 1st Floor, Office Bathroom, 3" x 3" White Ceramic Floor
- 2nd Floor, Office Bathroom, 1" x 1" Blue Ceramic Floor
- 1st Floor, Entry Bathroom, 1" x 1" Blue Ceramic Floor
- 2nd Floor, Entry Bathroom, 3" x 3" White Ceramic Floor

There was no lead detected in the remaining four samples collected of paint used at the Subject Property.

Mercury

There were no obvious mercury thermostats noted in the building during the time of this survey.



Other Metals

Several fluorescent light tubes were noted in the building during the time of this survey. These tubes may contain mercury and/or other metals. The tubes should be re-used if possible, or properly recycled or disposed of.

Polychlorinated Biphenols (PCBs)

Several fluorescent light fixtures were inspected and found to have electrical ballasts clearly marked “No PCBs”. These fixtures are similar to others used throughout the building. As necessary, all ballasts should be checked for PCB content and re-used or properly recycled or disposed of.

There were no other obvious PCB-containing materials noted in the building during the time of this survey.

Tanks

There were no obvious aboveground or underground fuel oil tanks noted with the building during the time of this survey.

Other

There was no obvious significant evidence of mold noted in the building.

There were no other obvious environmental concerns noted with the subject building during the time of this survey.

Contractors and other personnel who may come into contact with lead-containing materials should be notified of its existence and location.



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1.0 Introduction

Eco Compliance Corporation was contracted by Kitsap County Commissioner's Office (the Client) to perform a Hazardous Building Material Survey of the Mile Hill Health club property located at 4459 Southeast Mile Hill Drive, Port Orchard, Washington (the Subject Property). The Subject Property is identified on Figure 1. The survey was conducted on July 26, 2021. Future plans call for the renovation of this structure. The purpose of this investigation was to identify asbestos-containing materials (ACM) and Lead-Based Paint (LBP) within the building. The building was also evaluated for other potentially hazardous building materials such as lead, mercury-containing thermostats, Polychlorinated Biphenyl (PCB) containing light ballasts and fuel storage tanks.

Previous investigations or related historical documentation associated with the Subject Property was not provided or reviewed as part of this survey.

The subject building is a two-story structure. The building size is approximately 20,040 square feet wood frame structure with a concrete slab-on-grade foundation. Interior building materials consist of typical concrete and metal. Lighting is provided by fluorescent fixtures. The results of the survey are briefly summarized below. The Subject Property boundary and site plan are identified on Figure 2.

Accessible areas throughout the Subject Property were inspected. No destructive or intrusive assessment methods were utilized as part of this survey.

Access to building materials and structural details was limited to surficial observations of accessible materials. Only nominal surficial material disturbance was authorized so as to limit disturbance and damage to existing building finishing materials. Destructive investigation was not performed, and suspect ACM and LBP may have been obscured from inspection due to overlying material applications and limited access.

The Methods, Scope of Investigation, and Results of the survey are discussed below.

2.0 Asbestos Survey

2.1 Methods

The asbestos survey was conducted following guidance established under the Asbestos Hazard Emergency Response Act (AHERA). Mr. McAlister is a certified AHERA building inspector.

The subject building was not occupied during the time of the asbestos survey. Electrical panels and mechanical equipment were in operation and could not be fully inspected.



Areas of homogenous areas of suspected ACM were identified prior to the collection of representative samples. Homogenous areas are defined as consisting of similar appearance, age, use, type, color, and / or texture. Homogenous areas of building materials exist in the form of surfacing materials, thermal systems insulation, and miscellaneous materials. These materials are described as follows:

- Surfacing Materials – Surfacing materials include sprayed or troweled-on applications of materials such as fireproofing, acoustical or decorative ceiling materials, or plaster;
- Thermal System Insulation (TSI) – TSI materials include materials applied to pipes, fittings, boilers, ducts, or other interior structural components to prevent heat loss or gain, water condensation, or other such purposes; and
- Miscellaneous Materials – Miscellaneous materials include any building material on structural components or fixtures such as floor and ceiling tiles, which do not include surfacing material or TSI.

Suspect ACM are sampled to obtain a representative analysis of the material type throughout each homogeneous area. Bulk samples, representing individual homogenous areas of suspect ACM, are collected in a randomly distributed manner. Samples are mechanically extracted to the substrate so as to obtain a sample containing all discrete layers. The samples are then placed in self-sealing plastic bags and assigned unique sample identification. The number of samples collected is based on the material classification and quantity of each homogeneous area observed during the inspection as follows:

- Surfacing Materials:
 - A minimum of three (3) bulk samples are collected from each homogeneous area less than or equal to 1,000 square feet;
 - A minimum of five (5) bulk samples are collected from each homogeneous area greater than 1,000 square feet, but less than or equal to 5,000 square feet; and
 - A minimum of seven (7) bulk samples are collected from each homogeneous area greater than 5,000.
- Thermal System Insulation:
 - A minimum of three (3) bulk samples are collected from each homogeneous area of TSI;
 - A minimum of one (1) bulk sample is collected from each patch of TSI, providing the section of patch is less than six (6) linear or square feet; and
 - A minimum of three (3) bulk samples are collected of each insulated mechanical system including but not limited to cementitious material used on pipe fittings such as tees, elbows, or valves. A sufficient number of samples are collected to determine if each homogenous area is asbestos containing.

Bulk samples are not required to be collected from any material the accredited asbestos inspector has determined to be a non-suspect ACM (i.e., fiberglass, foam glass, rubber, or



any other non-op[ACM). Identified TSI was inspected using visual and tactile methods. The TSI present at the property was found to be typical of fiberglass material, not ACM, and therefore samples of this material were not collected.

- Miscellaneous Materials:
 - A minimum of two (2) representative bulk samples are collected of each miscellaneous material.

Identified suspect ACM were classified as being in Good, Fair, or Poor condition as follows:

- Good Condition -Any material which is intact with no noticeable damage;
- Fair Condition -Any material with a small amount of overall or localized damage (generally less than 10% of the entire area); and
- Poor Condition -Any material with a large amount of damage (generally greater than 10% of the entire surface area).

Asbestos Containing Material, as defined by the United States Environmental Protection Agency (EPA) and the Occupational Safety and Health Administration (OSHA), are materials with an asbestos concentration of greater than one percent ($> 1\%$). The U.S. EPA further defines friable and non-friable ACM as follows:

- Friable ACM – Defined by the EPA Asbestos National Emission Standards for Hazardous Air Pollutants (NESHAP) as any material containing more than one percent (1%) asbestos as determined using the method specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1 (i.e., the PLM method), when dry, can be crumbled, pulverized or reduced to powder by hand pressure. The term includes non-friable ACM after such previously non-friable material becomes damaged to the extent it may be crumbled when dry, pulverized, or reduced to powder by hand pressure;
- Non-friable ACM – Any material containing more than one percent (1%) asbestos, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure. The EPA further defines two categories of non-friable ACM;
- Category I non-friable ACM – Any asbestos-containing packing, gasket, resilient floor covering or asphalt roofing product, which contains more than one percent (1%) asbestos; and
- Category II non-friable ACM – Any material, excluding Category I non-friable ACBM, containing more than one percent (1%) asbestos, cannot be crumbled when dry pulverized, or reduced to powder by hand pressure.

Identified friable and non-friable ACMs are categorized into the appropriate NESHAP Classification. If an ACM is assessed as non-friable and does not meet the standards of one of the four (4) listed Regulated Asbestos-Containing Material (RACM) categories, it is considered a non-RACM.



Regulated Asbestos-Containing Material consists of the following:

- Friable ACM;
- Category I non-friable ACM becoming or has become friable;
- Category I non-friable ACM subjected to sanding, grinding, cutting or abrading previously or in the future; or
- Category II non-friable ACM with a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations.

2.2 Scope of Investigation

Reasonable efforts were made to identify multiple layers of flooring systems by spot-checking select few locations. However, per client request, very limited destructive investigation was performed. Wall chases, plenum chases, and plumbing chases were also inspected with limited disturbance; as such, suspect ACM may be present within wall chases, plenum chases, and plumbing chases and not observed during this limited inspection. Destructive investigation was not performed, and suspect ACM may have been obscured from inspection due to overlying material applications and limited access. Interior asbestos sampling locations are identified on Figure 3. Exterior asbestos sampling locations are identified on Figure 4.

2.3 Results

Overall, a total of 53 samples were collected from the Subject Property and analyzed for asbestos content (sample numbers 1 through 53). Several samples contained multiple layers resulting in one bulk sample being reported with multiple results. If one layer of a bulk sample is reported as asbestos containing, the entire bulk sample is considered to be asbestos containing. Samples were transmitted to under chain of custody procedures and analyzed by Novo Laboratories in Burien, Washington. Novo Laboratories is a fully accredited laboratory for the analysis of asbestos-containing materials.

The samples were analyzed for asbestos by Polarized Light Microscopy (PLM) using dispersion staining in accordance with U.S. EPA Procedures outlined in 40 CFR 763, Subpart F, Appendix A (AHERA). Utilizing the PLM 600R/R-93/116 method, the result given is a semi-quantitative result (down to <1%) which reflects a calibrated visual estimate from an analyst using both Polarized Light Microscopy and Stereomicroscopy.

Asbestos analytical data is attached as Appendix A and summarized in Table 1.

From Table 1 and based on field notes of similar materials observed throughout the subject building, asbestos was not detected in the building materials sampled.



There were no other obvious suspect asbestos materials noted with the building during the time of this survey.

The building materials identified as ACMs are in good condition and are considered to be non-friable unless otherwise noted on Table 1. Materials in good condition have a low exposure potential in their current state. Monitor conditions regularly and maintain all asbestos-containing materials in good (intact) condition.

3.0 Lead-Based Paint Survey

3.1 Methods

The United States EPA and United States Department of Housing and Urban Development (HUD) consider paint to be lead-containing (regulated) if it has an analytical lab result of 5,000 parts-per-million (ppm [mg/kg]) or more. The Washington State Department of Labor and Industries (L&I) considers a material to be lead-containing (regulated) if it has any detectable concentration of lead (>0 ppm) based on lab analysis. Use of LBP was banned for consumer applications and products in 1978. After the 1978 ban, LBP was still available for select commercial and industrial applications, and paints and coating with lesser concentrations of lead were still available. Paints and coatings containing any detectable concentration of lead, including concentrations less-than, equal-to, or greater-than 0.5% by weight (or equivalent) are referred to as Lead-Containing Paint (LCP).

A lead-containing paint (LCP) inspection is a surface-by-surface investigation to determine the presence of LCP applications and other surface applications and materials containing lead. Lead may be present in paint applications as well as surface coatings, ceramic and other materials glazing applications, and other building materials. Identification of surfaces and materials requiring sampling as part of the inspection is not limited to paint applications. Painted applications (and other surfaces) appearing similar in color, texture and substrate are considered to be a homogeneous material for the purpose of sample collection.

The method employed for testing painted surfaces was with an X-ray fluorescence (XRF) analyzer. A Heuresis Pb200i X-Ray fluorescence (XRF) lead paint analyzer was utilized to sample paint for lead content. The instrument was calibrated to the manufacturer's specifications and was also periodically verified against the National Institute of Standards and Testing (NIST) Standard Reference Material (SRM) 2579 lead film (1.0 mg/cm²). The instrument was in-control at all times for the wood zero standard and NIST SRM lead standard.

A visual inspection consisting of a walkthrough of the subject site was conducted to determine the presence of suspect LCM components that were readily accessible and/or exposed. This included the identification of suspect lead-based painted components,



ceramic tile, glazed components, etc. and the determination of the condition of those components. All coated surfaces, including but not limited to painted, varnished, and glazed surfaces, were tested for lead content.

3.2 Scope of Investigation

Testing was conducted in accordance with Chapter 7 of the Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing as published by HUD in 2012. XRF readings were obtained on representative painted surfaces on each building component in each room equivalent. The HUD definition of lead-based paint is equal to or greater than 1.0 mg/cm² (or the more stringent regulatory requirement in Los Angeles County of 0.7 mg/cm²). All XRF readings below the regulatory definition are considered negative and all readings at and above this level are considered positive.

Given the apparent age of the building, lead is suspected in the various interior and exterior paints. A total of eight (8) composite paint samples were analyzed for total lead content. Results obtained from the XRF Meter are summarized in Table 2.

3.3 Results

As indicated in Table 2, lead was detected in the following at concentrations above the L&I threshold but not the EPA/HUD standard.

- 1st Floor, Office Bathroom, 3" x 3" White Ceramic Floor
- 2nd Floor, Office Bathroom, 1" x 1" Blue Ceramic Floor
- 1st Floor, Entry Bathroom, 1" x 1" Blue Ceramic Floor
- 2nd Floor, Entry Bathroom, 3" x 3" White Ceramic Floor

There was no lead detected in the remaining four (4) samples collected of paint used at the Subject Property.



4.0 Other Potential Site Hazards

4.1 Mercury

There were no obvious mercury thermostats noted in the building during the time of this survey.

4.2 Other Metals

Several fluorescent light tubes were noted in the building during the time of this survey. These tubes may contain mercury and/or other metals.

4.3 PCBs

Polychlorinated biphenyls (PCBs) are a chemical component of many dielectric fluids, heat transfer fluids, hydraulic fluids, lubricating oils, paints, or coatings manufactured prior to July 2, 1979. Equipment potentially containing PCBs includes electrical equipment such as transformers or capacitors or hydraulically operated equipment, such as elevators, compaction equipment, or manufacturing equipment. The manufacture and distribution of PCBs was banned for use in 1979 by the United States Congress, which enacted the Toxic Substance and Control Act. In accordance with US Code of Federal Regulations the owner of a transformer or other PCB-containing equipment is responsible for equipment maintenance and remediation in the event of a leak or release.

Several fluorescent light fixtures were inspected and found to have electrical ballasts clearly marked "No PCBs". These fixtures are similar to others used throughout the building.

There were no other obvious PCB-containing materials noted in the building during the time of this survey.

4.4 Tanks

There were no obvious aboveground or underground fuel oil tanks noted with the building during the time of this survey.



4.5 Other

There was no obvious significant evidence of mold noted in the building.

There were no other obvious environmental concerns noted with the subject building during the time of this survey.

5.0 Recommendations

Overall, a total of 53 samples were collected from the subject building and analyzed for asbestos content. There was no asbestos detected in any of these samples. No further action or investigation is necessary in regards to asbestos containing materials.

Tenants, contractors, and other personnel who may come into contact with lead-containing materials should be notified of the existence and location of these materials.

6.0 Signature



David McAlister

AHERA Building Inspector, certification number 180733, expires March 10, 2022



7.0 Limitations

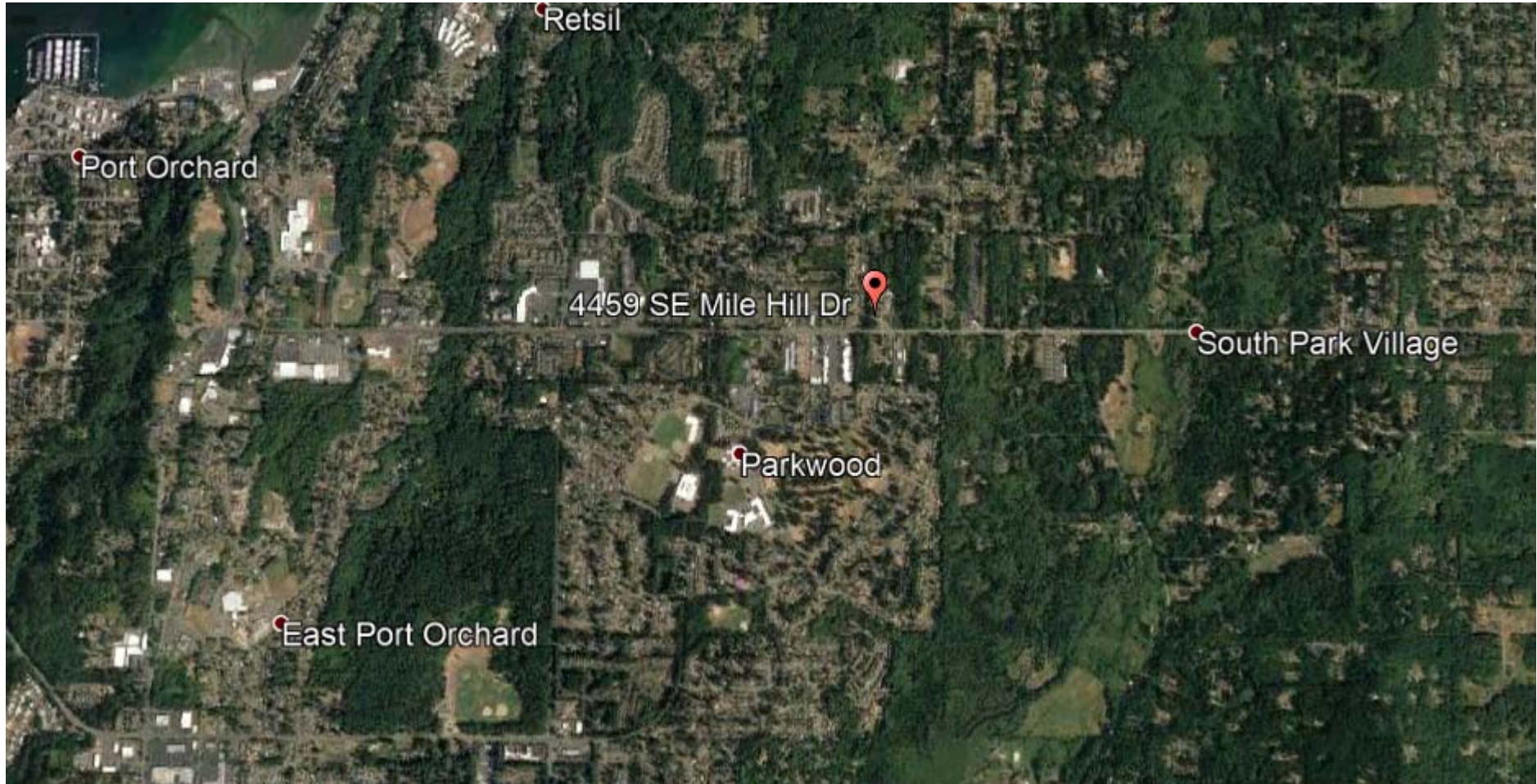
This survey was conducted using reasonable efforts to identify asbestos and other hazardous materials. However, without demolishing the building, some materials may exist in unforeseen or inaccessible areas. As a result, it is recommended an asbestos building inspector or other competent person be available onsite during renovation to ensure no asbestos or other hazardous materials exist in areas or materials not identified herein.

Services performed were conducted in a manner above the care and skill ordinarily and currently exercised by members of the same profession in the same geographical area. The possibility exists for even the most comprehensive scope of services to fail to detect environmental liabilities on a particular site. No expressed or implied representation or warranty is included or intended within this or other reports.

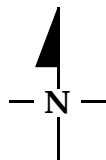
This report is intended for the sole use of the Client and its authorized representatives. In accordance with the agreed scope of services. Unless explicitly authorized in this report, no third party is beneficiary to the contract or findings of this report. The unauthorized use or reliance of this document or the findings, conclusion or recommendations presented herein, by any other party or parties is at the sole risk of any such third party.



Figures



SOURCE: Google Earth, 2021



TITLE:		Site Location Map	
LOCATION:		4459 Southeast Mile Hill Drive, Port Orchard, Washington	
	Eco Compliance Corporation		FIGURE: 1
	800 5 th Avenue, Suite 101-313 Seattle, WA 98104		
	562-489-7908 DirtyProperty.com		
	CHECKED:	D.McAlister	
DRAFTED:	R. Lavering		
FILE:			
DATE:	02/24/2021		




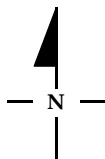
4459 SE Mile Hill Dr

Structure

Parking Area

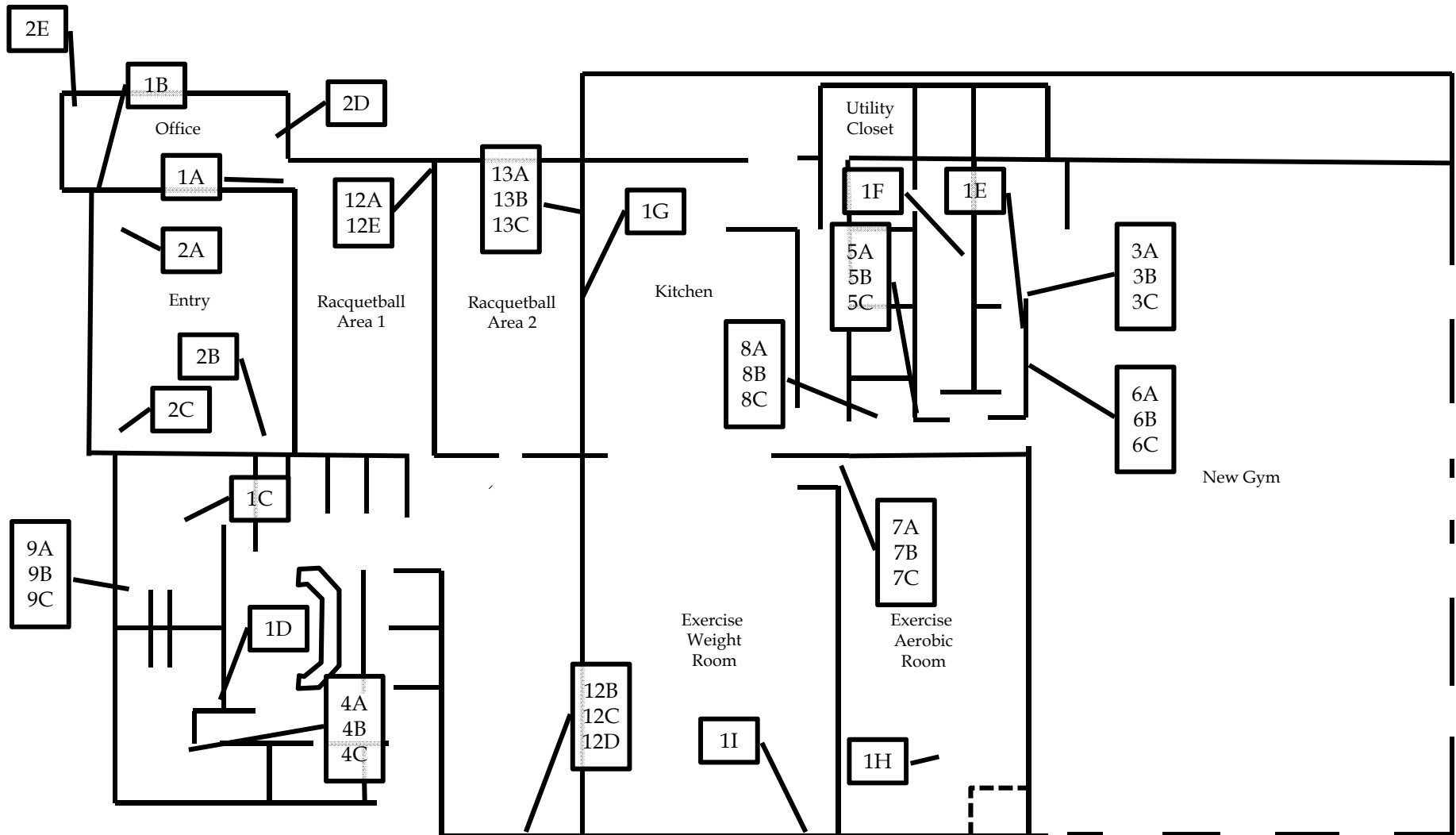
Legend:

 Subject Property Boundary



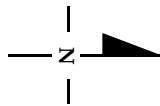
SOURCE: Google Earth 2021

TITLE:		Site Plan	
LOCATION:		4459 Southeast Mile Hill, Port Orchard, Washington	
	Eco Compliance Corporation 800 5th Avenue, Suite 101-313 Seattle, WA 98104 562-489-7908 DirtyProperty.com		CHECKED: D.McAlister DRAFTED: R. Lavering FILE: DATE: 5/10/2021
			FIGURE: <h1 style="margin: 0;">2</h1>




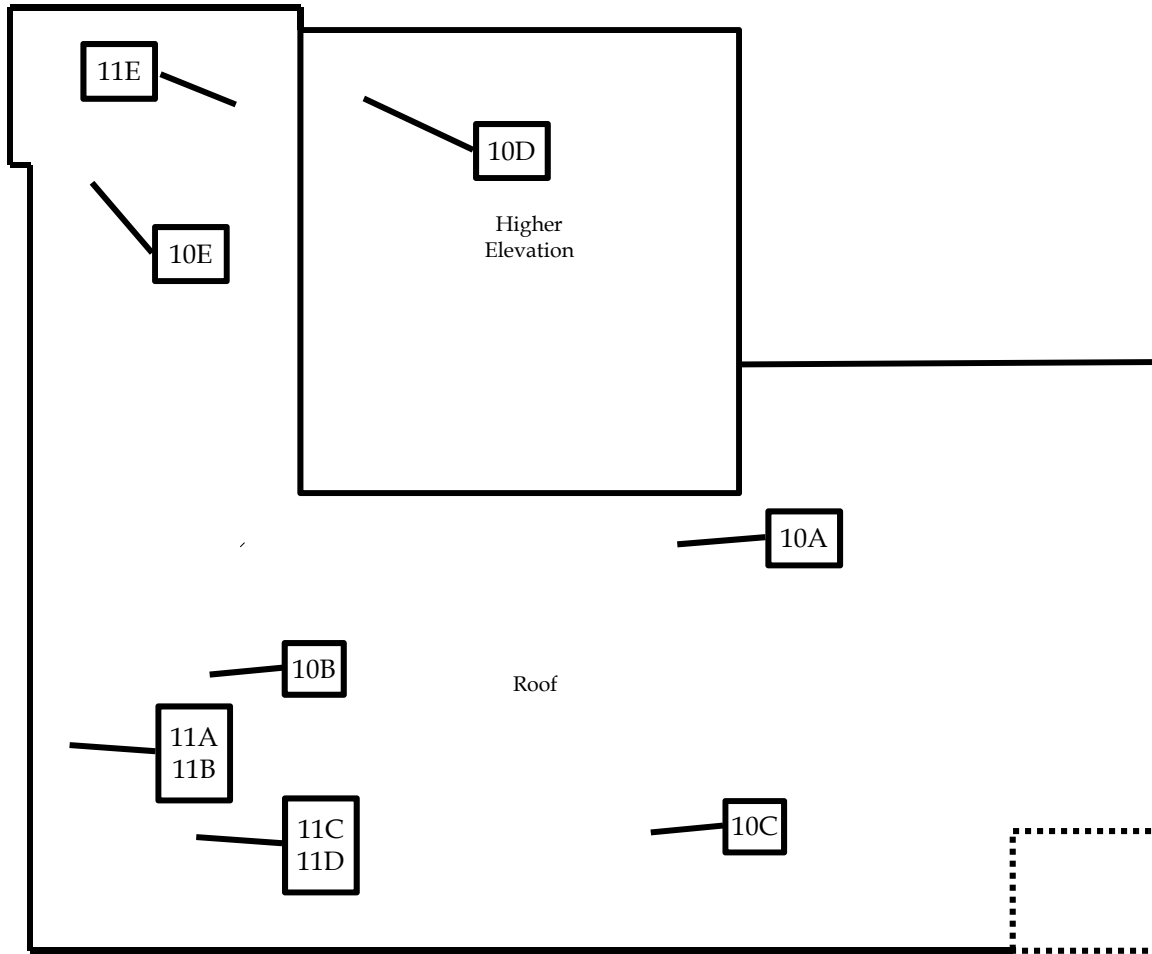
Legend:

--- Damaged Section



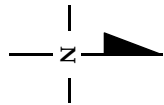
SOURCE: *Seattle Parks and Recreation / Abrahams Architects*

TITLE: Interior Asbestos Sample Locations			
LOCATION: 4459 Southeast Mile Hill, Port Orchard, Washington			
 Eco Compliance Corporation 800 5th Avenue, Suite 101-313 Seattle, WA 98104 562-489-7908 DirtyProperty.com	CHECKED:	D.McAlister	FIGURE: 3
	DRAFTED:	R. Lavinger	
	FILE:		
	DATE:	08/02/2021	




Legend:

----- Damaged Section



SOURCE: *Seattle Parks and Recreation / Abrahams Architects*

TITLE: Exterior Asbestos Sample Locations			
LOCATION: 4459 Southeast Mile Hill, Port Orchard, Washington			
 <p>Eco Compliance Corporation 800 5th Avenue, Suite 101-313 Seattle, WA 98104 562-489-7908 DirtyProperty.com</p>	CHECKED:	D.McAlister	FIGURE: 4
	DRAFTED:	R. Lavinger	
	FILE:		
	DATE:	08/02/2021	

Tables

Table 1 - Asbestos Sampling Results
Mile Hill Health Club
4459 Southeast Mile Hill Drive, Port Orchard, Washington

Sample ID	Location	Description	Laboratory Results
212145-A-001A	1st Floor, Office Bathroom, North Wall	Drywall with Joint Compound	ND
212145-A-001B	1st Floor, Office, East Wall	Drywall with Joint Compound	ND
212145-A-001C	Main Floor, Women Locker Room South, South Wall	Drywall with Joint Compound	ND
212145-A-001D	Main Floor, Men Locker Room South, North Wall	Drywall with Joint Compound	ND
212145-A-001E	Main Floor, Women Locker Room West, North Wall	Drywall with Joint Compound	ND
212145-A-001F	Main Floor, Men Locker Room West, North Wall	Drywall with Joint Compound	ND
212145-A-001G	Main Floor, Kitchen, South Wall	Drywall with Joint Compound	ND
212145-A-001H	Main Floor, Aerobics Room, Ceiling	Drywall with Joint Compound	ND
212145-A-001I	Main Floor, Weight Room, East Wall	Drywall with Joint Compound	ND
212145-A-002A	1st Floor, Entry, Ceiling	24" x 24" White Polka Dots Ceiling Tile	ND
212145-A-002B	1st Floor, Entry, Ceiling	24" x 24" White Polka Dots Ceiling Tile	ND
212145-A-002C	1st Floor, Entry, Ceiling	24" x 24" White Polka Dots Ceiling Tile	ND
212145-A-002D	1st Floor, Entry, Ceiling	24" x 24" White Polka Dots Ceiling Tile	ND
212145-A-002E	1st Floor, Entry, Ceiling	24" x 24" White Polka Dots Ceiling Tile	ND
212145-A-003A	Main Floor, Women Locker Room West	4" Dark Red Cove Base/Cove Base Mastic	ND
212145-A-003B	Main Floor, Women Locker Room West	4" Dark Red Cove Base/Cove Base Mastic	ND
212145-A-003C	Main Floor, Women Locker Room West	4" Dark Red Cove Base/Cove Base Mastic	ND
212145-A-004A	Main Floor, Men Locker Room South	4" Teal Cove Base/Cove Base Mastic	ND
212145-A-004B	Main Floor, Men Locker Room South	4" Teal Cove Base/Cove Base Mastic	ND
212145-A-004C	Main Floor, Men Locker Room South	4" Teal Cove Base/Cove Base Mastic	ND
212145-A-005A	Main Floor, Men Locker Room West	4" White Cove Base/Cove Base Mastic	ND
212145-A-005B	Main Floor, Men Locker Room West	4" White Cove Base/Cove Base Mastic	ND
212145-A-005C	Main Floor, Men Locker Room West	4" White Cove Base/Cove Base Mastic	ND
212145-A-006A	Main Floor, Women Locker Room West	4" Gray Cove Base/Cove Base Mastic	ND
212145-A-006B	Main Floor, Women Locker Room West	4" Gray Cove Base/Cove Base Mastic	ND
212145-A-006C	Main Floor, Women Locker Room West	4" Gray Cove Base/Cove Base Mastic	ND
212145-A-007A	Main Floor, Aerobics Room	6" Brown Cove Base/Cove Base Mastic	ND
212145-A-007B	Main Floor, Aerobics Room	6" Brown Cove Base/Cove Base Mastic	ND
212145-A-007C	Main Floor, Aerobics Room	6" Brown Cove Base/Cove Base Mastic	ND
212145-A-008A	Main Floor, Utility Closet	4" Dark Blue Cove Base/Cove Base Mastic	ND
212145-A-008B	Main Floor, Utility Closet	4" Dark Blue Cove Base/Cove Base Mastic	ND
212145-A-008C	Main Floor, Utility Closet	4" Dark Blue Cove Base/Cove Base Mastic	ND
212145-A-009A	Main Floor, Women Locker Room South	4" Beige Cove Base/Cove Base Mastic	ND
212145-A-009B	Main Floor, Women Locker Room South	4" Beige Cove Base/Cove Base Mastic	ND
212145-A-009C	Main Floor, Women Locker Room South	4" Beige Cove Base/Cove Base Mastic	ND
212145-A-010A	Roof, Exterior	Rolled Rock Roof Core	ND
212145-A-010B	Roof, Exterior	Rolled Rock Roof Core	ND
212145-A-010C	Roof, Exterior	Rolled Rock Roof Core	ND
212145-A-010D	Roof, Exterior	Rolled Rock Roof Core	ND
212145-A-010E	Roof, Exterior	Rolled Rock Roof Core	ND
212145-A-011A	Roof, Exterior	Roof Penetration Mastic	ND
212145-A-011B	Roof, Exterior	Roof Penetration Mastic	ND
212145-A-011C	Roof, Exterior	Roof Penetration Mastic	ND
212145-A-011D	Roof, Exterior	Roof Penetration Mastic	ND
212145-A-011E	Roof, Exterior	Roof Penetration Mastic	ND
212145-A-012A	1st Floor, Exterior, West Wall	Felt Paper	ND
212145-A-012B	Main Floor, Exterior, East Wall	Felt Paper	ND
212145-A-012C	Main Floor, Exterior, East Wall	Felt Paper	ND
212145-A-012D	Main Floor, Exterior, East Wall	Felt Paper	ND
212145-A-012E	Main Floor, Exterior, West Wall	Felt Paper	ND
212145-A-013A	Main Floor, Racket Ball Area 2, North Wall	Brown Mastic	ND
212145-A-013B	Main Floor, Racket Ball Area 2, North Wall	Brown Mastic	ND
212145-A-013C	Main Floor, Racket Ball Area 2, North Wall	Brown Mastic	ND

Note:

ND - Asbestos was not detected in the sample.

* - Friable or otherwise categorized as Regulated Asbestos-Containing Material (RACM).

All samples classified as being in, "Good" condition unless noted.

Table 2 - Lead Analytical Results
Mile Hill Health Club
4459 Southeast Mile Hill Drive, Port Orchard, Washington

Sample ID	Location	Description	Lead Content (ppm / mg/Kg)
212145-XRF-0001	Calibration	NA	0.010
212145-XRF-0002	Calibration	NA	0.011
212145-XRF-0003	Calibration	NA	0.010
212145-XRF-0004	1st Floor, Office Bathroom	3" x 3" White Ceramic Floor	0.030
212145-XRF-0005	2nd Floor, Office Bathroom	1" x 1" Blue Ceramic Floor	0.020
212145-XRF-0006	Main Floor, Women Locker Room South	1" x 1" Beige Ceramic Floor	0.001
212145-XRF-0007	1st Floor, Entry Bathroom	1" x 1" Blue Ceramic Floor	0.020
212145-XRF-0008	2nd Floor, Entry Bathroom	3" x 3" White Ceramic Floor	0.027
212145-XRF-0009	Main Floor, Men Locker Room South	2" x 1' White Granite Baseboard Tile	0.000
212145-XRF-0010	Main Floor, Men Locker Room South	2" x 1' White Granite Baseboard Tile	0.001
212145-XRF-0011	Main Floor, Men Locker Room South	2" x 1' White Granite Baseboard Tile	0.001
212145-XRF-0012	Calibration	NA	0.010
212145-XRF-0013	Calibration	NA	0.010
212145-XRF-0014	Calibration	NA	0.010

Note:

ND (<100) - Lead was not detected in the sample at the laboratory detection limit displayed.

RED VALUES - Exceed EPA / HUD regulatory limit of 5,000 ppm or mg/Kg

BLUE VALUES - Exceeds Washington State Department of Labor and Industries (L&I) regulatory limit of any detectable lead.

Detected concentrations equal-to, or greater-than 0.5% (500 ppm / mg/Kg) by weight are referred to as Lead-Containing Paint (LCP).

Appendix A

Asbestos Analytical Results



Laboratory & Consulting Services, Inc.

**NOVO Laboratory &
Consulting, Inc.**

138 SW 154th Street
Burien, WA 98166

Office: (206) 244-1060
Fax: (206) 244-1063

August 2, 2021

Robert Williams
Eco Compliance
800 5th Avenue #101-313
Seattle, WA 98104

RE: Bulk Asbestos Fiber Analysis; Batch 121-1431

Dear Robert

Thank you for choosing NOVO Laboratory and Consulting, Inc. as your laboratory. Enclosed you will find test results for the bulk samples submitted to the laboratory. The samples were examined for the presence of identifiable asbestos fibers using polarized light microscopy (PLM) with dispersion staining in accordance with the U.S. EPA Method 600/R-93/166, "Method for determination of asbestos in Bulk Building Materials."

The samples containing more than one separable layer were separated and given an individual result, as required by the National Emission Standard for Hazardous Air Pollutants (NESHAP, 40 CFR - Part 61) protocol that multi-layered samples be analyzed and reported separately. Asbestos concentration in samples is determined by visual estimation and reported by percent on a volume basis.

For samples with asbestos concentrations between 1 and 10 percent based on visual estimation, the EPA recommends a procedure known as point counting. Point counting is a statistically more accurate means of quantification for samples with low concentrations of asbestos. An alternative method also recommended by the EPA is to have the sample analyzed by transmission electronic microscopy methods. If you would like us to follow any of the recommendations listed above, please contact us.

For samples containing vermiculite, prior to its close in 1990, much of the world's supply of vermiculite came from a mine near Libby, Montana. This mine had a natural deposit of asbestos which resulted in the vermiculite being contaminated with asbestos. Attic insulation produced using vermiculite ore, particularly ore that originated from the Libby mine, may contain asbestos fibers. Due to inconsistencies in the levels of contamination of vermiculite and limitations in the current best practice analytical methods the EPA recommends that vermiculite be presumed to contain asbestos.

This report is confidential and will not be released without prior written approval. Samples are archived for Fifteen (15) days following analysis. Please contact us if samples need to be archived longer than the standard holding time.

The information you receive relates only to the items tested. Accuracy of the results is limited by the methodology and expertise of the sample collector. The analyses at NOVO Laboratory and Consulting, Inc. are cross-checked with other laboratories for quality assurance purposes.

Thank you for using NOVO Laboratory and Consulting, Inc. If you have any questions please don't hesitate to call.

Crystal Wright
Laboratory Supervisor
Enclosure: Bulk Sample Results



Laboratory & Consulting Services, Inc.

NOVO Laboratory & Consulting, Inc.

138 SW 154th Street
Burien, WA 98166

Office: (206) 244-1060 Fax: (206) 244-1063

**Bulk Asbestos
Analysis Report**

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» **CLIENT**

CLIENT ID 1188.01	CLIENT Eco Compliance	CONTACT Robert Williams
JOB ID MCALISTER	JOB 4459 South Seast Mile Hill Dr	

» **BULK SAMPLE BATCH**

BATCH ID 121-1431	CLIENT PO 212145	SAMPLING DATE 7-27-21	SAMPLES TAKEN BY Client			
DATE REC'D 7-27-21	SAMPLES SUBMITTED 53	SAMPLES ANALYZED 53	SAMPLES NOT ANALYZED	SAMPLES NOT REVIEWED	DATE REV'D 7-27-21	REVIEWED BY Anna Ringoen
BATCH ANALYSIS SUMMARY None of the analyzed samples contained identifiable asbestos.						

» **SAMPLE 121-1431 / 1**

CLIENT ID 01A	CLIENT DESCRIPTION	LOCATION 1st F, Office Bathroom, N Wall	
LAB DESCRIPTION Jc/Dw	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed
SAMPLE ANALYSIS SUMMARY No identifiable asbestos was detected in this sample.			

» **LAYER 1**

Paint with powder

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **LAYER 2**

Tan papery material with powder

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Cellulose	15%
Non-Fibrous	Filler and Binder	85%

» **SAMPLE 121-1431 / 2**

CLIENT ID 01B	CLIENT DESCRIPTION	LOCATION 1 F, Office, E Wall	
LAB DESCRIPTION Jc/Dw	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed
SAMPLE ANALYSIS SUMMARY No identifiable asbestos was detected in this sample.			

» **LAYER 1**

Paint and woven material with powder

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **LAYER 2**

Tan papery material with powder

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Cellulose	15%
Non-Fibrous	Filler and Binder	85%

» CLIENT		
CLIENT ID 1188.01	CLIENT Eco Compliance	CONTACT Robert Williams
JOB ID MCALISTER	JOB 4459 South Seast Mile Hill Dr	

» BULK SAMPLE BATCH						
BATCH ID 121-1431	CLIENT PO 212145	SAMPLING DATE 7-27-21	SAMPLES TAKEN BY Client			
DATE REC'D 7-27-21	SAMPLES SUBMITTED 53	SAMPLES ANALYZED 53	SAMPLES NOT ANALYZED	SAMPLES NOT REVIEWED	DATE REV'D 7-27-21	REVIEWED BY Anna Ringoen
BATCH ANALYSIS SUMMARY None of the analyzed samples contained identifiable asbestos.						

» SAMPLE 121-1431 / 3				
CLIENT ID 01C	CLIENT DESCRIPTION	LOCATION M F, Wmn Locker Rm S, S Wall		
LAB DESCRIPTION Jc/Dw	ANALYZED BY Anna Ringoen		ANALYSIS DATE 07-29-21	STATUS Analyzed
SAMPLE ANALYSIS SUMMARY No identifiable asbestos was detected in this sample.				

» LAYER 1		
Paint with powder		
COMPOSITION CATEGORY Non-Fibrous	FIBER TYPE Filler and Binder	PERCENTAGE 100%

» LAYER 2		
Tan papery material with powder		
COMPOSITION CATEGORY Non-Asbestos Fibrous	FIBER TYPE Cellulose	PERCENTAGE 15%
Non-Fibrous	Filler and Binder	85%

» SAMPLE 121-1431 / 4				
CLIENT ID 01D	CLIENT DESCRIPTION	LOCATION M F, Mn Locker Rm S, N Wall		
LAB DESCRIPTION Jc/Dw	ANALYZED BY Anna Ringoen		ANALYSIS DATE 07-29-21	STATUS Analyzed
SAMPLE ANALYSIS SUMMARY No identifiable asbestos was detected in this sample.				

» LAYER 1		
Paint with powder		
COMPOSITION CATEGORY Non-Fibrous	FIBER TYPE Filler and Binder	PERCENTAGE 100%

» LAYER 2		
Tan papery material with powder		
COMPOSITION CATEGORY Non-Asbestos Fibrous	FIBER TYPE Cellulose	PERCENTAGE 30%
Non-Fibrous	Filler and Binder	70%



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» **CLIENT**

CLIENT ID 1188.01	CLIENT Eco Compliance	CONTACT Robert Williams
JOB ID MCALISTER	JOB 4459 South Seast Mile Hill Dr	

» **BULK SAMPLE BATCH**

BATCH ID 121-1431	CLIENT PO 212145	SAMPLING DATE 7-27-21	SAMPLES TAKEN BY Client			
DATE REC'D 7-27-21	SAMPLES SUBMITTED 53	SAMPLES ANALYZED 53	SAMPLES NOT ANALYZED	SAMPLES NOT REVIEWED	DATE REV'D 7-27-21	REVIEWED BY Anna Ringoen
BATCH ANALYSIS SUMMARY None of the analyzed samples contained identifiable asbestos.						

» **SAMPLE 121-1431 / 5**

CLIENT ID 01 E	CLIENT DESCRIPTION	LOCATION M F, Wmn Locker Rm W, N Wall			
LAB DESCRIPTION Jc/Dw	ANALYZED BY Anna Ringoen		ANALYSIS DATE 07-29-21	STATUS Analyzed	
SAMPLE ANALYSIS SUMMARY No identifiable asbestos was detected in this sample.					

» **LAYER 1**

Paint with powder

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **LAYER 2**

Tan papery material with powder

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Cellulose	30%
Non-Fibrous	Filler and Binder	70%

» **SAMPLE 121-1431 / 6**

CLIENT ID 01F	CLIENT DESCRIPTION	LOCATION M F, Mn Locker Rm W, N Wall			
LAB DESCRIPTION Jc/Dw	ANALYZED BY Anna Ringoen		ANALYSIS DATE 07-29-21	STATUS Analyzed	
SAMPLE ANALYSIS SUMMARY No identifiable asbestos was detected in this sample.					

» **LAYER 1**

Paint with powder

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **LAYER 2**

Tan papery material with powder

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Cellulose	25%
Non-Fibrous	Filler and Binder	75%

» **CLIENT**

CLIENT ID 1188.01	CLIENT Eco Compliance	CONTACT Robert Williams
JOB ID MCALISTER	JOB 4459 South Seast Mile Hill Dr	

» **BULK SAMPLE BATCH**

BATCH ID 121-1431	CLIENT PO 212145	SAMPLING DATE 7-27-21	SAMPLES TAKEN BY Client			
DATE REC'D 7-27-21	SAMPLES SUBMITTED 53	SAMPLES ANALYZED 53	SAMPLES NOT ANALYZED	SAMPLES NOT REVIEWED	DATE REV'D 7-27-21	REVIEWED BY Anna Ringoen

BATCH ANALYSIS SUMMARY

None of the analyzed samples contained identifiable asbestos.

» **SAMPLE 121-1431 / 7**

CLIENT ID 01G	CLIENT DESCRIPTION	LOCATION M F, Kitchen, S Wall	
LAB DESCRIPTION Jc/Dw	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed

SAMPLE ANALYSIS SUMMARY

No identifiable asbestos was detected in this sample.

» **LAYER 1**

Paint with powder

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **LAYER 2**

Tan papery material with powder

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Cellulose	35%
Non-Fibrous	Filler and Binder	70%

» **SAMPLE 121-1431 / 8**

CLIENT ID 01H	CLIENT DESCRIPTION	LOCATION M F, Aerobics Rm, Ceiling	
LAB DESCRIPTION Jc/Dw	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed

SAMPLE ANALYSIS SUMMARY

No identifiable asbestos was detected in this sample.

» **LAYER 1**

Paint on white powder with woven material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Glass Fiber	25%
Non-Fibrous	Filler and Binder	75%

» **LAYER 2**

Tan papery material with powder

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Cellulose	35%
Non-Fibrous	Filler and Binder	65%



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» **CLIENT**

CLIENT ID 1188.01	CLIENT Eco Compliance	CONTACT Robert Williams
JOB ID MCALISTER	JOB 4459 South Seast Mile Hill Dr	

» **BULK SAMPLE BATCH**

BATCH ID 121-1431	CLIENT PO 212145	SAMPLING DATE 7-27-21	SAMPLES TAKEN BY Client			
DATE REC'D 7-27-21	SAMPLES SUBMITTED 53	SAMPLES ANALYZED 53	SAMPLES NOT ANALYZED	SAMPLES NOT REVIEWED	DATE REV'D 7-27-21	REVIEWED BY Anna Ringoen
BATCH ANALYSIS SUMMARY None of the analyzed samples contained identifiable asbestos.						

» **SAMPLE 121-1431 / 9**

CLIENT ID 011	CLIENT DESCRIPTION	LOCATION M F, Weight Rm, E Wall			
LAB DESCRIPTION Jc/Dw	ANALYZED BY Anna Ringoen		ANALYSIS DATE 07-29-21	STATUS Analyzed	
SAMPLE ANALYSIS SUMMARY No identifiable asbestos was detected in this sample.					

» **LAYER 1**

Paint with powder

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **LAYER 2**

Tan papery material with powder

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	35%
Non-Fibrous	Filler and Binder	65%

» **SAMPLE 121-1431 / 10**

CLIENT ID 02A	CLIENT DESCRIPTION	LOCATION 1st F, Entry, Ceiling			
LAB DESCRIPTION Ceiling Tile	ANALYZED BY Anna Ringoen		ANALYSIS DATE 07-29-21	STATUS Analyzed	
SAMPLE ANALYSIS SUMMARY No identifiable asbestos was detected in this sample.					

» **LAYER 1**

Paint on gray compressed fibrous material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Cellulose	35%
Non-Asbestos Fibrous	Mineral Wool	35%
Non-Fibrous	Filler and Binder	30%



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» **CLIENT**

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» **BULK SAMPLE BATCH**

BATCH ID 121-1431	CLIENT PO 212145	SAMPLING DATE 7-27-21	SAMPLES TAKEN BY Client			
DATE REC'D 7-27-21	SAMPLES SUBMITTED 53	SAMPLES ANALYZED 53	SAMPLES NOT ANALYZED	SAMPLES NOT REVIEWED	DATE REV'D 7-27-21	REVIEWED BY Anna Ringoen

BATCH ANALYSIS SUMMARY

None of the analyzed samples contained identifiable asbestos.

» **SAMPLE 121-1431 / 11**

CLIENT ID 02B	CLIENT DESCRIPTION	LOCATION 1st F, Entry Ceiling	
LAB DESCRIPTION Ceiling Tile	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed

SAMPLE ANALYSIS SUMMARY

No identifiable asbestos was detected in this sample.

» **LAYER 1**

Paint on gray compressed fibrous material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Cellulose	35%
Non-Asbestos Fibrous	Mineral Wool	35%
Non-Fibrous	Filler and Binder	30%

» **SAMPLE 121-1431 / 12**

CLIENT ID 02C	CLIENT DESCRIPTION	LOCATION 1st F, Entry Ceiling	
LAB DESCRIPTION Ceiling Tile	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed

SAMPLE ANALYSIS SUMMARY

No identifiable asbestos was detected in this sample.

» **LAYER 1**

Paint on gray compressed fibrous material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Cellulose	35%
Non-Asbestos Fibrous	Mineral Wool	35%
Non-Fibrous	Filler and Binder	30%

» **SAMPLE 121-1431 / 13**

CLIENT ID 02D	CLIENT DESCRIPTION	LOCATION 1st F, Office, Ceiling	
LAB DESCRIPTION Ceiling Tile	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed

SAMPLE ANALYSIS SUMMARY

No identifiable asbestos was detected in this sample.

» **LAYER 1**

Paint on gray compressed fibrous material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Cellulose	35%
Non-Asbestos Fibrous	Mineral Wool	35%
Non-Fibrous	Filler and Binder	30%



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» **CLIENT**

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» **BULK SAMPLE BATCH**

BATCH ID 121-1431	CLIENT PO 212145	SAMPLING DATE 7-27-21	SAMPLES TAKEN BY Client			
DATE REC'D 7-27-21	SAMPLES SUBMITTED 53	SAMPLES ANALYZED 53	SAMPLES NOT ANALYZED	SAMPLES NOT REVIEWED	DATE REV'D 7-27-21	REVIEWED BY Anna Ringoen
BATCH ANALYSIS SUMMARY None of the analyzed samples contained identifiable asbestos.						

» **SAMPLE 121-1431 / 14**

CLIENT ID 02E	CLIENT DESCRIPTION	LOCATION 1st F, Office, Ceiling	
LAB DESCRIPTION Ceiling Tile	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed
SAMPLE ANALYSIS SUMMARY No identifiable asbestos was detected in this sample.			

» **LAYER 1**

Paint on gray compressed fibrous material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Cellulose	35%
Non-Asbestos Fibrous	Mineral Wool	35%
Non-Fibrous	Filler and Binder	30%

» **SAMPLE 121-1431 / 15**

CLIENT ID 03A	CLIENT DESCRIPTION	LOCATION M F, Wmn Locker Rm W	
LAB DESCRIPTION Cove Base/Mastic	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed
SAMPLE ANALYSIS SUMMARY No identifiable asbestos was detected in this sample.			

» **LAYER 1**

Dark red pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **LAYER 2**

White pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» CLIENT

CLIENT ID 1188.01	CLIENT Eco Compliance	CONTACT Robert Williams
JOB ID MCALISTER	JOB 4459 South Seast Mile Hill Dr	

» BULK SAMPLE BATCH

BATCH ID 121-1431	CLIENT PO 212145	SAMPLING DATE 7-27-21	SAMPLES TAKEN BY Client			
DATE REC'D 7-27-21	SAMPLES SUBMITTED 53	SAMPLES ANALYZED 53	SAMPLES NOT ANALYZED	SAMPLES NOT REVIEWED	DATE REV'D 7-27-21	REVIEWED BY Anna Ringoen

BATCH ANALYSIS SUMMARY

None of the analyzed samples contained identifiable asbestos.

» SAMPLE 121-1431 / 16

CLIENT ID 03B	CLIENT DESCRIPTION	LOCATION M F, Wmn Locker Rm W	
LAB DESCRIPTION Cove Base/Mastic	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed

SAMPLE ANALYSIS SUMMARY

No identifiable asbestos was detected in this sample.

» LAYER 1

Dark red pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» LAYER 2

White pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» SAMPLE 121-1431 / 17

CLIENT ID 03C	CLIENT DESCRIPTION	LOCATION M F, Wmn Locker Rm W	
LAB DESCRIPTION Cove Base/Mastic	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed

SAMPLE ANALYSIS SUMMARY

No identifiable asbestos was detected in this sample.

» LAYER 1

Dark red pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» LAYER 2

White pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%



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» **CLIENT**

CLIENT ID 1188.01	CLIENT Eco Compliance	CONTACT Robert Williams
JOB ID MCALISTER	JOB 4459 South Seast Mile Hill Dr	

» **BULK SAMPLE BATCH**

BATCH ID 121-1431	CLIENT PO 212145	SAMPLING DATE 7-27-21	SAMPLES TAKEN BY Client			
DATE REC'D 7-27-21	SAMPLES SUBMITTED 53	SAMPLES ANALYZED 53	SAMPLES NOT ANALYZED	SAMPLES NOT REVIEWED	DATE REV'D 7-27-21	REVIEWED BY Anna Ringoen

BATCH ANALYSIS SUMMARY

None of the analyzed samples contained identifiable asbestos.

» **SAMPLE 121-1431 / 18**

CLIENT ID 04A	CLIENT DESCRIPTION	LOCATION M F, Men Locker Rm S	
LAB DESCRIPTION Cove Base/Mastic	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed

SAMPLE ANALYSIS SUMMARY

No identifiable asbestos was detected in this sample.

» **LAYER 1**

Light blue pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **LAYER 2**

White pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **SAMPLE 121-1431 / 19**

CLIENT ID 04B	CLIENT DESCRIPTION	LOCATION M F, Men Locker Rm S	
LAB DESCRIPTION Cove Base/Mastic	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed

SAMPLE ANALYSIS SUMMARY

No identifiable asbestos was detected in this sample.

» **LAYER 1**

Light blue pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **LAYER 2**

White pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%



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» **CLIENT**

CLIENT ID 1188.01	CLIENT Eco Compliance	CONTACT Robert Williams
JOB ID MCALISTER	JOB 4459 South Seast Mile Hill Dr	

» **BULK SAMPLE BATCH**

BATCH ID 121-1431	CLIENT PO 212145	SAMPLING DATE 7-27-21	SAMPLES TAKEN BY Client			
DATE REC'D 7-27-21	SAMPLES SUBMITTED 53	SAMPLES ANALYZED 53	SAMPLES NOT ANALYZED	SAMPLES NOT REVIEWED	DATE REV'D 7-27-21	REVIEWED BY Anna Ringoen
BATCH ANALYSIS SUMMARY None of the analyzed samples contained identifiable asbestos.						

» **SAMPLE 121-1431 / 20**

CLIENT ID 04C	CLIENT DESCRIPTION	LOCATION M F, Men Locker Rm S	
LAB DESCRIPTION Cove Base/Mastic	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed
SAMPLE ANALYSIS SUMMARY No identifiable asbestos was detected in this sample.			

» **LAYER 1**

Light blue pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **LAYER 2**

White pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **SAMPLE 121-1431 / 21**

CLIENT ID 05A	CLIENT DESCRIPTION	LOCATION M F, Men Locker Rm W	
LAB DESCRIPTION Cove Base/Mastic	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed
SAMPLE ANALYSIS SUMMARY No identifiable asbestos was detected in this sample.			

» **LAYER 1**

White pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **LAYER 2**

White pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%



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» **CLIENT**

CLIENT ID 1188.01	CLIENT Eco Compliance	CONTACT Robert Williams
JOB ID MCALISTER	JOB 4459 South Seast Mile Hill Dr	

» **BULK SAMPLE BATCH**

BATCH ID 121-1431	CLIENT PO 212145	SAMPLING DATE 7-27-21	SAMPLES TAKEN BY Client			
DATE REC'D 7-27-21	SAMPLES SUBMITTED 53	SAMPLES ANALYZED 53	SAMPLES NOT ANALYZED	SAMPLES NOT REVIEWED	DATE REV'D 7-27-21	REVIEWED BY Anna Ringoen
BATCH ANALYSIS SUMMARY None of the analyzed samples contained identifiable asbestos.						

» **SAMPLE 121-1431 / 22**

CLIENT ID 05B	CLIENT DESCRIPTION	LOCATION M F, Men Locker Rm W			
LAB DESCRIPTION Cove Base/Mastic	ANALYZED BY Anna Ringoen		ANALYSIS DATE 07-29-21	STATUS Analyzed	
SAMPLE ANALYSIS SUMMARY No identifiable asbestos was detected in this sample.					

» **LAYER 1**

White pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **LAYER 2**

White pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **SAMPLE 121-1431 / 23**

CLIENT ID 05C	CLIENT DESCRIPTION	LOCATION M F, Men Locker Rm W			
LAB DESCRIPTION Cove Base/Mastic	ANALYZED BY Anna Ringoen		ANALYSIS DATE 07-29-21	STATUS Analyzed	
SAMPLE ANALYSIS SUMMARY No identifiable asbestos was detected in this sample.					

» **LAYER 1**

White pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **LAYER 2**

White pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%



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» **CLIENT**

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JOB ID MCALISTER	JOB 4459 South Seast Mile Hill Dr	

» **BULK SAMPLE BATCH**

BATCH ID 121-1431	CLIENT PO 212145	SAMPLING DATE 7-27-21	SAMPLES TAKEN BY Client			
DATE REC'D 7-27-21	SAMPLES SUBMITTED 53	SAMPLES ANALYZED 53	SAMPLES NOT ANALYZED	SAMPLES NOT REVIEWED	DATE REV'D 7-27-21	REVIEWED BY Anna Ringoen
BATCH ANALYSIS SUMMARY None of the analyzed samples contained identifiable asbestos.						

» **SAMPLE 121-1431 / 24**

CLIENT ID 06A	CLIENT DESCRIPTION	LOCATION M F, Wmn Locker Rm W			
LAB DESCRIPTION Cove Base/Mastic	ANALYZED BY Anna Ringoen		ANALYSIS DATE 07-29-21	STATUS Analyzed	
SAMPLE ANALYSIS SUMMARY No identifiable asbestos was detected in this sample.					

» **LAYER 1**

Gray pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **LAYER 2**

White pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **SAMPLE 121-1431 / 25**

CLIENT ID 06B	CLIENT DESCRIPTION	LOCATION M F, Wmn Locker Rm W			
LAB DESCRIPTION Cove Base/Mastic	ANALYZED BY Anna Ringoen		ANALYSIS DATE 07-29-21	STATUS Analyzed	
SAMPLE ANALYSIS SUMMARY No identifiable asbestos was detected in this sample.					

» **LAYER 1**

Gray pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **LAYER 2**

White pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **CLIENT**

CLIENT ID 1188.01	CLIENT Eco Compliance	CONTACT Robert Williams
JOB ID MCALISTER	JOB 4459 South Seast Mile Hill Dr	

» **BULK SAMPLE BATCH**

BATCH ID 121-1431	CLIENT PO 212145	SAMPLING DATE 7-27-21	SAMPLES TAKEN BY Client			
DATE REC'D 7-27-21	SAMPLES SUBMITTED 53	SAMPLES ANALYZED 53	SAMPLES NOT ANALYZED	SAMPLES NOT REVIEWED	DATE REV'D 7-27-21	REVIEWED BY Anna Ringoen

BATCH ANALYSIS SUMMARY

None of the analyzed samples contained identifiable asbestos.

» **SAMPLE 121-1431 / 26**

CLIENT ID 06C	CLIENT DESCRIPTION	LOCATION M F, Wmn Locker Rm W	
LAB DESCRIPTION Cove Base/Mastic	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed

SAMPLE ANALYSIS SUMMARY

No identifiable asbestos was detected in this sample.

» **LAYER 1**

Gray pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **LAYER 2**

White pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **SAMPLE 121-1431 / 27**

CLIENT ID 07A	CLIENT DESCRIPTION	LOCATION M F, Aerobics Rm	
LAB DESCRIPTION Cove Base/Mastic	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed

SAMPLE ANALYSIS SUMMARY

No identifiable asbestos was detected in this sample.

» **LAYER 1**

Brown thick hard material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **LAYER 2**

Brown mastic

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%



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» **CLIENT**

CLIENT ID 1188.01	CLIENT Eco Compliance	CONTACT Robert Williams
JOB ID MCALISTER	JOB 4459 South Seast Mile Hill Dr	

» **BULK SAMPLE BATCH**

BATCH ID 121-1431	CLIENT PO 212145	SAMPLING DATE 7-27-21	SAMPLES TAKEN BY Client			
DATE REC'D 7-27-21	SAMPLES SUBMITTED 53	SAMPLES ANALYZED 53	SAMPLES NOT ANALYZED	SAMPLES NOT REVIEWED	DATE REV'D 7-27-21	REVIEWED BY Anna Ringoen

BATCH ANALYSIS SUMMARY

None of the analyzed samples contained identifiable asbestos.

» **SAMPLE 121-1431 / 28**

CLIENT ID 07B	CLIENT DESCRIPTION	LOCATION M F, Aerobics Rm	
LAB DESCRIPTION Cove Base/Mastic	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed

SAMPLE ANALYSIS SUMMARY

No identifiable asbestos was detected in this sample.

» **LAYER 1**

Brown thick hard material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **LAYER 2**

Brown mastic

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **SAMPLE 121-1431 / 29**

CLIENT ID 07C	CLIENT DESCRIPTION	LOCATION M F, Aerobics Rm	
LAB DESCRIPTION Cove Base/Mastic	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed

SAMPLE ANALYSIS SUMMARY

No identifiable asbestos was detected in this sample.

» **LAYER 1**

Brown thick hard material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **LAYER 2**

Brown mastic

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%



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» **CLIENT**

CLIENT ID 1188.01	CLIENT Eco Compliance	CONTACT Robert Williams
JOB ID MCALISTER	JOB 4459 South Seast Mile Hill Dr	

» **BULK SAMPLE BATCH**

BATCH ID 121-1431	CLIENT PO 212145	SAMPLING DATE 7-27-21	SAMPLES TAKEN BY Client			
DATE REC'D 7-27-21	SAMPLES SUBMITTED 53	SAMPLES ANALYZED 53	SAMPLES NOT ANALYZED	SAMPLES NOT REVIEWED	DATE REV'D 7-27-21	REVIEWED BY Anna Ringoen

BATCH ANALYSIS SUMMARY

None of the analyzed samples contained identifiable asbestos.

» **SAMPLE 121-1431 / 30**

CLIENT ID 08A	CLIENT DESCRIPTION	LOCATION M F, Utility Closet	
LAB DESCRIPTION Cove Base/Mastic	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed

SAMPLE ANALYSIS SUMMARY

No identifiable asbestos was detected in this sample.

» **LAYER 1**

Grren pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **LAYER 2**

White pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **SAMPLE 121-1431 / 31**

CLIENT ID 08B	CLIENT DESCRIPTION	LOCATION M F, Utility Closet	
LAB DESCRIPTION Cove Base/Mastic	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed

SAMPLE ANALYSIS SUMMARY

No identifiable asbestos was detected in this sample.

» **LAYER 1**

Green pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **LAYER 2**

White pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%



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» **CLIENT**

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» **BULK SAMPLE BATCH**

BATCH ID 121-1431	CLIENT PO 212145	SAMPLING DATE 7-27-21	SAMPLES TAKEN BY Client			
DATE REC'D 7-27-21	SAMPLES SUBMITTED 53	SAMPLES ANALYZED 53	SAMPLES NOT ANALYZED	SAMPLES NOT REVIEWED	DATE REV'D 7-27-21	REVIEWED BY Anna Ringoen

BATCH ANALYSIS SUMMARY

None of the analyzed samples contained identifiable asbestos.

» **SAMPLE 121-1431 / 32**

CLIENT ID 08C	CLIENT DESCRIPTION	LOCATION M F, Utility Closet	
LAB DESCRIPTION Cove Base/Mastic	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed

SAMPLE ANALYSIS SUMMARY

No identifiable asbestos was detected in this sample.

» **LAYER 1**

Green pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **LAYER 2**

White pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **SAMPLE 121-1431 / 33**

CLIENT ID 09A	CLIENT DESCRIPTION	LOCATION M F, Wmn Locker Rm S	
LAB DESCRIPTION Cove Base/Mastic	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed

SAMPLE ANALYSIS SUMMARY

No identifiable asbestos was detected in this sample.

» **LAYER 1**

Tan pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **LAYER 2**

White pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%



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» **CLIENT**

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JOB ID MCALISTER	JOB 4459 South Seast Mile Hill Dr	

» **BULK SAMPLE BATCH**

BATCH ID 121-1431	CLIENT PO 212145	SAMPLING DATE 7-27-21	SAMPLES TAKEN BY Client			
DATE REC'D 7-27-21	SAMPLES SUBMITTED 53	SAMPLES ANALYZED 53	SAMPLES NOT ANALYZED	SAMPLES NOT REVIEWED	DATE REV'D 7-27-21	REVIEWED BY Anna Ringoen

BATCH ANALYSIS SUMMARY

None of the analyzed samples contained identifiable asbestos.

» **SAMPLE 121-1431 / 34**

CLIENT ID 09B	CLIENT DESCRIPTION	LOCATION M F, Wmn Locker Rm S	
LAB DESCRIPTION Cove Base/Mastic	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed

SAMPLE ANALYSIS SUMMARY

No identifiable asbestos was detected in this sample.

» **LAYER 1**

Tan pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **SAMPLE 121-1431 / 35**

CLIENT ID 09C	CLIENT DESCRIPTION	LOCATION M F, Wmn Locker Rm S	
LAB DESCRIPTION Cove Base/Mastic	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed

SAMPLE ANALYSIS SUMMARY

No identifiable asbestos was detected in this sample.

» **LAYER 1**

Tan pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **LAYER 2**

White pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **SAMPLE 121-1431 / 36**

CLIENT ID 10A	CLIENT DESCRIPTION	LOCATION Roof, Exterior	
LAB DESCRIPTION Roofing	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed

SAMPLE ANALYSIS SUMMARY

No identifiable asbestos was detected in this sample.

» **LAYER 1**

Black asphaltic fibrous material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Glass Fiber	40%
Non-Fibrous	Asphalt Filler and Binder	60%

» CLIENT		
CLIENT ID 1188.01	CLIENT Eco Compliance	CONTACT Robert Williams
JOB ID MCALISTER	JOB 4459 South Seast Mile Hill Dr	

» BULK SAMPLE BATCH						
BATCH ID 121-1431	CLIENT PO 212145	SAMPLING DATE 7-27-21	SAMPLES TAKEN BY Client			
DATE REC'D 7-27-21	SAMPLES SUBMITTED 53	SAMPLES ANALYZED 53	SAMPLES NOT ANALYZED	SAMPLES NOT REVIEWED	DATE REV'D 7-27-21	REVIEWED BY Anna Ringoen
BATCH ANALYSIS SUMMARY None of the analyzed samples contained identifiable asbestos.						

» SAMPLE 121-1431 / 37			
CLIENT ID 10B	CLIENT DESCRIPTION	LOCATION Roof, Exterior	
LAB DESCRIPTION Roofing	ANALYZED BY Anna Ringoen	ANALYSIS DATE 08-02-21	STATUS Analyzed
SAMPLE ANALYSIS SUMMARY No identifiable asbestos was detected in this sample.			

» LAYER 1		
Black coating on white mineral granules with black asphaltic fibrous material		
COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Glass Fiber	40%
Non-Fibrous	Mineral Granules	10%
Non-Fibrous	Asphalt Filler and Binder	50%

» LAYER 2		
Black asphaltic fibrous material		
COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Glass Fiber	55%
Non-Fibrous	Asphalt Filler and Binder	45%

» SAMPLE 121-1431 / 38			
CLIENT ID 10C	CLIENT DESCRIPTION	LOCATION Roof, Exterior	
LAB DESCRIPTION Roofing	ANALYZED BY Anna Ringoen	ANALYSIS DATE 08-02-21	STATUS Analyzed
SAMPLE ANALYSIS SUMMARY No identifiable asbestos was detected in this sample.			

» LAYER 1		
Black flat asphaltic fibrous material		
COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Cellulose	15%
Non-Fibrous	Asphalt Filler and Binder	85%



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» CLIENT

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» BULK SAMPLE BATCH

BATCH ID 121-1431	CLIENT PO 212145	SAMPLING DATE 7-27-21	SAMPLES TAKEN BY Client			
DATE REC'D 7-27-21	SAMPLES SUBMITTED 53	SAMPLES ANALYZED 53	SAMPLES NOT ANALYZED	SAMPLES NOT REVIEWED	DATE REV'D 7-27-21	REVIEWED BY Anna Ringoen

BATCH ANALYSIS SUMMARY

None of the analyzed samples contained identifiable asbestos.

» SAMPLE 121-1431 / 39

CLIENT ID 10D	CLIENT DESCRIPTION	LOCATION Roof, Exterior	
LAB DESCRIPTION Roofing	ANALYZED BY Anna Ringoen	ANALYSIS DATE 08-02-21	STATUS Analyzed

SAMPLE ANALYSIS SUMMARY

No identifiable asbestos was detected in this sample.

» LAYER 1

Black flat asphaltic fibrous material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Cellulose	15%
Non-Fibrous	Asphalt Filler and Binder	85%

» LAYER 2

Black asphaltic fibrous material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Glass Fiber	55%
Non-Fibrous	Asphalt Filler and Binder	45%

» SAMPLE 121-1431 / 40

CLIENT ID 10E	CLIENT DESCRIPTION	LOCATION Roof, Exterior	
LAB DESCRIPTION Roofing	ANALYZED BY Anna Ringoen	ANALYSIS DATE 08-02-21	STATUS Analyzed

SAMPLE ANALYSIS SUMMARY

No identifiable asbestos was detected in this sample.

» LAYER 1

Black flat asphaltic fibrous material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Cellulose	30%
Non-Fibrous	Asphalt Filler and Binder	70%

» LAYER 2

Black asphaltic fibrous material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Glass Fiber	55%
Non-Fibrous	Asphalt Filler and Binder	45%



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» **CLIENT**

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» **BULK SAMPLE BATCH**

BATCH ID 121-1431	CLIENT PO 212145	SAMPLING DATE 7-27-21	SAMPLES TAKEN BY Client			
DATE REC'D 7-27-21	SAMPLES SUBMITTED 53	SAMPLES ANALYZED 53	SAMPLES NOT ANALYZED	SAMPLES NOT REVIEWED	DATE REV'D 7-27-21	REVIEWED BY Anna Ringoen
BATCH ANALYSIS SUMMARY None of the analyzed samples contained identifiable asbestos.						

» **SAMPLE 121-1431 / 41**

CLIENT ID 11A	CLIENT DESCRIPTION	LOCATION Roof, Exterior			
LAB DESCRIPTION Roof Mastic	ANALYZED BY Anna Ringoen		ANALYSIS DATE 07-29-21	STATUS Analyzed	
SAMPLE ANALYSIS SUMMARY No identifiable asbestos was detected in this sample.					

» **LAYER 1**

Brittle black asphaltic material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Cellulose	2%
Non-Fibrous	Asphalt Filler and Binder	98%

» **SAMPLE 121-1431 / 42**

CLIENT ID 11B	CLIENT DESCRIPTION	LOCATION Roof, Exterior			
LAB DESCRIPTION Roof Mastic	ANALYZED BY Anna Ringoen		ANALYSIS DATE 07-29-21	STATUS Analyzed	
SAMPLE ANALYSIS SUMMARY No identifiable asbestos was detected in this sample.					

» **LAYER 1**

Brittle black asphaltic material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Cellulose	2%
Non-Fibrous	Filler and Binder	98%

» **SAMPLE 121-1431 / 43**

CLIENT ID 11C	CLIENT DESCRIPTION	LOCATION Roof, Exterior			
LAB DESCRIPTION Roof Mastic	ANALYZED BY Anna Ringoen		ANALYSIS DATE 07-29-21	STATUS Analyzed	
SAMPLE ANALYSIS SUMMARY No identifiable asbestos was detected in this sample.					

» **LAYER 1**

Brittle black asphaltic material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Cellulose	2%
Non-Fibrous	Filler and Binder	98%



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» **CLIENT**

CLIENT ID 1188.01	CLIENT Eco Compliance	CONTACT Robert Williams
JOB ID MCALISTER	JOB 4459 South Seast Mile Hill Dr	

» **BULK SAMPLE BATCH**

BATCH ID 121-1431	CLIENT PO 212145	SAMPLING DATE 7-27-21	SAMPLES TAKEN BY Client
DATE REC'D 7-27-21	SAMPLES SUBMITTED 53	SAMPLES ANALYZED 53	SAMPLES NOT ANALYZED
SAMPLES NOT REVIEWED		DATE REV'D 7-27-21	REVIEWED BY Anna Ringoen

BATCH ANALYSIS SUMMARY

None of the analyzed samples contained identifiable asbestos.

» **SAMPLE 121-1431 / 44**

CLIENT ID 11D	CLIENT DESCRIPTION	LOCATION Roof, Exterior
LAB DESCRIPTION Roof Mastic	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21
STATUS Analyzed		

SAMPLE ANALYSIS SUMMARY

No identifiable asbestos was detected in this sample.

» **LAYER 1**

Brittle black asphaltic material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Cellulose	2%
Non-Fibrous	Filler and Binder	98%

» **SAMPLE 121-1431 / 45**

CLIENT ID 11E	CLIENT DESCRIPTION	LOCATION Roof, Exterior
LAB DESCRIPTION Roof Mastic	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21
STATUS Analyzed		

SAMPLE ANALYSIS SUMMARY

No identifiable asbestos was detected in this sample.

» **LAYER 1**

Brittle black asphaltic material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Cellulose	2%
Non-Fibrous	Filler and Binder	98%

» **SAMPLE 121-1431 / 46**

CLIENT ID 12A	CLIENT DESCRIPTION	LOCATION 1st F, Exterior, W Wall
LAB DESCRIPTION Felt Paper	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21
STATUS Analyzed		

SAMPLE ANALYSIS SUMMARY

No identifiable asbestos was detected in this sample.

» **LAYER 1**

Black and tan papery material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Cellulose	70%
Non-Fibrous	Asphalt Filler and Binder	15%
Non-Fibrous	Filler and Binder	15%



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» CLIENT

CLIENT ID 1188.01	CLIENT Eco Compliance	CONTACT Robert Williams
JOB ID MCALISTER	JOB 4459 South Seast Mile Hill Dr	

» BULK SAMPLE BATCH

BATCH ID 121-1431	CLIENT PO 212145	SAMPLING DATE 7-27-21	SAMPLES TAKEN BY Client			
DATE REC'D 7-27-21	SAMPLES SUBMITTED 53	SAMPLES ANALYZED 53	SAMPLES NOT ANALYZED	SAMPLES NOT REVIEWED	DATE REV'D 7-27-21	REVIEWED BY Anna Ringoen

BATCH ANALYSIS SUMMARY

None of the analyzed samples contained identifiable asbestos.

» SAMPLE 121-1431 / 47

CLIENT ID 12B	CLIENT DESCRIPTION	LOCATION M F, Exterior E, E Wall	
LAB DESCRIPTION Felt Paper	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed

SAMPLE ANALYSIS SUMMARY

No identifiable asbestos was detected in this sample.

» LAYER 1

Black and tan papery material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Cellulose	70%
Non-Fibrous	Asphalt Filler and Binder	15%
Non-Fibrous	Filler and Binder	15%

» SAMPLE 121-1431 / 48

CLIENT ID 12C	CLIENT DESCRIPTION	LOCATION M F, Exterior, E Wall	
LAB DESCRIPTION Felt Paper	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed

SAMPLE ANALYSIS SUMMARY

No identifiable asbestos was detected in this sample.

» LAYER 1

Black and tan papery material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Cellulose	70%
Non-Fibrous	Asphalt Filler and Binder	15%
Non-Fibrous	Filler and Binder	15%

» SAMPLE 121-1431 / 49

CLIENT ID 12D	CLIENT DESCRIPTION	LOCATION M F, Exterior, E Wall	
LAB DESCRIPTION Felt Paper	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed

SAMPLE ANALYSIS SUMMARY

No identifiable asbestos was detected in this sample.

» LAYER 1

Black and tan papery material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Cellulose	70%
Non-Fibrous	Asphalt Filler and Binder	15%
Non-Fibrous	Filler and Binder	15%



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» **CLIENT**

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» **BULK SAMPLE BATCH**

BATCH ID 121-1431	CLIENT PO 212145	SAMPLING DATE 7-27-21	SAMPLES TAKEN BY Client			
DATE REC'D 7-27-21	SAMPLES SUBMITTED 53	SAMPLES ANALYZED 53	SAMPLES NOT ANALYZED	SAMPLES NOT REVIEWED	DATE REV'D 7-27-21	REVIEWED BY Anna Ringoen
BATCH ANALYSIS SUMMARY None of the analyzed samples contained identifiable asbestos.						

» **SAMPLE 121-1431 / 50**

CLIENT ID 12E	CLIENT DESCRIPTION	LOCATION M F, Exterior, W Wall			
LAB DESCRIPTION Felt Paper	ANALYZED BY Anna Ringoen		ANALYSIS DATE 07-29-21	STATUS Analyzed	
SAMPLE ANALYSIS SUMMARY No identifiable asbestos was detected in this sample.					

» **LAYER 1**

Black and tan papery material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Asbestos Fibrous	Cellulose	70%
Non-Fibrous	Asphalt Filler and Binder	15%
Non-Fibrous	Filler and Binder	15%

» **SAMPLE 121-1431 / 51**

CLIENT ID 13A	CLIENT DESCRIPTION	LOCATION M F, Racket Ball Area 2			
LAB DESCRIPTION Mastic	ANALYZED BY Anna Ringoen		ANALYSIS DATE 07-29-21	STATUS Analyzed	
SAMPLE ANALYSIS SUMMARY No identifiable asbestos was detected in this sample.					

» **LAYER 1**

Paint on tan pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

» **SAMPLE 121-1431 / 52**

CLIENT ID 13B	CLIENT DESCRIPTION	LOCATION M F, Racket Ball Area 2			
LAB DESCRIPTION Mastic	ANALYZED BY Anna Ringoen		ANALYSIS DATE 07-29-21	STATUS Analyzed	
SAMPLE ANALYSIS SUMMARY No identifiable asbestos was detected in this sample.					

» **LAYER 1**

Paint on tan pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%



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» **CLIENT**

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» **BULK SAMPLE BATCH**

BATCH ID 121-1431	CLIENT PO 212145	SAMPLING DATE 7-27-21	SAMPLES TAKEN BY Client			
DATE REC'D 7-27-21	SAMPLES SUBMITTED 53	SAMPLES ANALYZED 53	SAMPLES NOT ANALYZED	SAMPLES NOT REVIEWED	DATE REV'D 7-27-21	REVIEWED BY Anna Ringoen
BATCH ANALYSIS SUMMARY None of the analyzed samples contained identifiable asbestos.						

» **SAMPLE 121-1431 / 53**

CLIENT ID 13C	CLIENT DESCRIPTION	LOCATION M F, Racket Ball Area 2	
LAB DESCRIPTION Mastic	ANALYZED BY Anna Ringoen	ANALYSIS DATE 07-29-21	STATUS Analyzed
SAMPLE ANALYSIS SUMMARY No identifiable asbestos was detected in this sample.			

» **LAYER 1**

Paint on tan pliable material

COMPOSITION CATEGORY	FIBER TYPE	PERCENTAGE
Non-Fibrous	Filler and Binder	100%

[End of Batch]

Anna Ringoen, Staff Consultant

SECTION 01 10 00 - SUMMARY

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 1. Work covered by Contract Documents.
 2. Work by Owner or Others.
 3. Owner-furnished products.
 4. Use of premises.
 5. Contractor identification.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of Project is defined by the Contract Documents and consists of the following:
 1. The Work shall be the providing of all supplies, tools, equipment, scaffolding, shoring, transportation, utilities, services, superintendence, and labor, including architectural, structural, mechanical and electrical improvements, and the furnishing of all materials, items and accessories needed for the total construction of the project in strict conformance with the Contract Documents.
 2. The intent of the Contract Documents is that the Contractor will produce a complete project with all materials and equipments in place and all systems operative.
 3. The project will encompass work in the building of an existing building that previously operated as a fitness gym and will include but not be limited to the following: utilities, site fencing, site amenities, interior configurations, doors, painting, finishes, structural, mechanical and electrical work.
 4. All Work after the date specified for Substantial Completion (including punchlist work) shall be coordinated with the Owner and scheduled at the Owner's convenience.
 5. Prior to bidding, the Contractor shall visit the site and fully inform himself of the areas in which work is to take place.
 6. The Contractor represents that he has carefully examined prior to bidding, all Contract Documents and site conditions, fully understanding the character, quality and quantity of work called for and all conditions of the contract.

1.4 WORK BY OWNER OR OTHERS

- A. Owner reserves the right to perform Work at the facility site with its own forces or by separate contract during the duration of the Contract.
- B. Cooperate fully with Owner so work may be carried out smoothly, without interfering with or delaying work under this Contract or work by Owner. Coordinate the Work of this Contract with work performed by Owner.
- C. Work Provided by Owner under Separate contract: the following work will be performed by Owner using Owner-provided contractors or forces, concurrently with the Work of this Contract:
 1. Telecom, It and Low-Voltage: Owner provided and installed security cameras, PA speakers, WAP devices, telecom racks and associated equipment. Outlets and conduits are to be provided by the contractor and terminate at locations indicated on electrical drawings.
 2. Interior Room Signage: Owner-provided contractor to install room identification and wayfinding signage not included in this contract.

3. Furniture, fixtures: Owner provided and installed furniture, toilet/laundry accessories, and other items noted as owner-furnished, owner installed (OFOI).

1.5 OWNER-FURNISHED PRODUCTS

- A. Owner will furnish products indicated. The Work includes receiving, unloading, handling, storing, protecting, and installing Owner-furnished products.
- B. Owner-Furnished Products:
 1. Various FF&E Items indicated in drawings and noted as owner-furnished, contractor-installed (OFCl). See FFE Schedule.

1.6 USE OF PREMISES

- A. General: Each Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.
- B. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- C. Limit work to normal business working hours of 7:00 AM to 5:00 PM, Monday through Friday, unless otherwise agreed upon with Owner.
 1. Except for an emergency, Contractor shall provide forty-eight (48) hours' advance notice of his intent to work overtime, nights, weekends, or holidays, or anytime outside the usual working hours. In no case with the Contractor do any such work without first notifying the Owner to permit arrangements for proper inspection.
- D. Smoking and use of any controlled substances are not permitted on-site.

1.7 CONTRACTOR IDENTIFICATION

- A. Contractor and Subcontractor personnel shall, at all times on the project site, wear Contractor provided identification that is easily identified from no less than ten (10) feet away. Such identification shall be acceptable to the Owner, e.g. colored hard hats, colored tee-shirts, or identification badges of acceptable size.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 22 00 - UNIT PRICES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. List of unit prices, for use in preparing Bids.
- B. Measurement and payment criteria applicable to Work performed under a unit price payment method.
- C. Defect assessment and non-payment for rejected work.

1.2 RELATED REQUIREMENTS

- A. Section 012900 - Payment Procedures: Additional payment and modification procedures.

1.3 COSTS INCLUDED

- A. Unit Prices included on the Bid Form shall include full compensation for all required labor, products, tools, equipment, plant, transportation, services, and incidentals; erection, application or installation of an item of the Work; overhead and profit.

1.4 UNIT QUANTITIES SPECIFIED

- A. Quantities indicated in the Bid Form are for bidding and contract purposes only. Quantities and measurements of actual Work will determine the payment amount.

1.5 MEASUREMENT OF QUANTITIES

- A. Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the requirements of the individual specification section govern.
- B. Take all measurements and compute quantities. Measurements and quantities will be verified by Architect.
 - 1. Measurement is made "in place", either prior to removal or after placement.
- C. Measurement by Area: Measured by square dimension using mean length and width or radius.
- D. Perform surveys required to determine quantities, including control surveys to establish measurement reference lines. Notify Architect prior to starting work.
- E. Contractor's Engineer Responsibilities: Sign surveyor's field notes or keep duplicate field notes, calculate and certify quantities for payment purposes.

1.6 PAYMENT

- A. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work that is incorporated in or made necessary by the Work and accepted by the Architect, multiplied by the unit price.
- B. Payment will not be made for any of the following:
 - 1. Products wasted or disposed of in a manner that is not acceptable.
 - 2. Products determined as unacceptable before or after placement.
 - 3. Products not completely unloaded from the transporting vehicle.
 - 4. Products placed beyond the lines and levels of the required Work.
 - 5. Products remaining on hand after completion of the Work.
 - 6. Loading, hauling, and disposing of rejected Products.

1.7 DEFECT ASSESSMENT

- A. Replace Work, or portions of the Work, not conforming to specified requirements.
- B. If, in the opinion of Architect, it is not practical to remove and replace the Work, Architect will direct one of the following remedies:
 - 1. The defective Work may remain, but the unit price will be adjusted to a new unit price at the discretion of Architect.
 - 2. The defective Work will be partially repaired to the instructions of the Architect, and the unit price will be adjusted to a new unit price at the discretion of Architect.

- C. The individual specification sections may modify these options or may identify a specific formula or percentage price reduction.
 - D. The authority of Architect to assess the defect and identify payment adjustment is final.
- 1.8 SCHEDULE OF UNIT PRICES
- A. Material and labor for the removal of exterior sheathing and insulation. Installation of new insulation and exterior sheathing to match adjacent materials. The price is to be per square foot.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 25 00 - SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit electronic files in PDF format of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: See attachment..
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
 - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.

- j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within 5 working days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 10 working days of receipt of request, or five working days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

1.7 SUBSTITUTIONS

- A. Submit requests for substitution immediately on discovery of need for change, but not later than 10 working days prior to time required for preparation and review of related submittals.
 - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Substitution request is fully documented and properly submitted.
 - c. Requested substitution is compatible with other portions of the Work.
 - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - e. Requested substitution is compatible with other portions of the Work.
 - f. Requested substitution has been coordinated with other portions of the Work.
 - g. Requested substitution provides specified warranty.
 - h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

1.8

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SUBSTITUTION REQUEST FORM

TO: Architect: Rice Fergus Miller, Inc.
275 5th Street, Suite 100
Bremerton, Washington 98337

Project Name: Pacific Building Conversion

FROM: Contractor: _____

Section:	Page:	Paragraph:	Description:

The undersigned requests consideration of the following:

Proposed Substitution: _____

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes description of changes to Contract Documents which proposed substitution will require for its proper installation.

The undersigned states that the following paragraphs, unless modified on attachments, are correct:

1. The proposed substitution does not affect dimensions shown on Drawings.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse effect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed substitution.
5. The proposed substitution will have no effect on applicable codes.
6. The manufacturer's guarantee or warranties of proposed product is equivalent to, or exceeds that of the specified product.

The undersigned further states that the function, appearance and quality of the Proposed Substitution are equivalent or superior to the Specified item.

Submitted by: (Person and Firm) _____

Address: _____

Date: Phone: Signature: _____

For use by Architect: _____

By: _____ Accepted Accepted as Noted

Date: _____ Not Accepted Received too Late

Remarks: _____

Attachments:

END OF SUBSTITUTION REQUEST FORM

SECTION 01 26 00 - CONTRACT MODIFICATION PROCEDURES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

- B. Related Requirements:

- 1. Section 012500 "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.

1.3 MINOR CHANGES IN THE WORK

- A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.

1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

- 1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.

- 2. Within time specified in Proposal Request or 10 working days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

- a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.
 - d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 - e. Quotation Form: Use CSI Form 13.6D, "Proposal Worksheet Summary," and Form 13.6C, "Proposal Worksheet Detail." or forms acceptable to Architect.

- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.

- 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.

- 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.

- 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

- 4. Include costs of labor and supervision directly attributable to the change.

5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 6. Comply with requirements in Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
 7. Proposal Request Form: Use CSI Form 13.6A, "Change Order Request (Proposal)," with attachments CSI Form 13.6D, "Proposal Worksheet Summary," and Form 13.6C, "Proposal Worksheet Detail." or form acceptable to Architect.
- 1.5 CHANGE ORDER PROCEDURES
- A. On Owner's approval of a Work Changes Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.
- 1.6 CONSTRUCTION CHANGE DIRECTIVE
- A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
 - B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 29 00 - PAYMENT PROCEDURES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
 - 1. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 - 2. Section 013200 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.3 DEFINITIONS

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule. Cost-loaded Critical Path Method Schedule may serve to satisfy requirements for the schedule of values.
 - 1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
 - a. Application for Payment forms with continuation sheets.
 - b. Submittal schedule.
 - c. Items required to be indicated as separate activities in Contractor's construction schedule.
 - 2. Submit the schedule of values to Architect at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
 - 3. Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values coordinated with each phase of payment.
 - 4. Subschedules for Separate Elements of Work: Where the Contractor's construction schedule defines separate elements of the Work, provide subschedules showing values coordinated with each element.
 - 5. Subschedules for Separate Design Contracts: Where the Owner has retained design professionals under separate contracts who will each provide certification of payment requests, provide subschedules showing values coordinated with the scope of each design services contract as described in Section 011000 "Summary."
- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
 - 1. Identification: Include the following Project identification on the schedule of values:
 - a. Project name and location.
 - b. Name of Architect.
 - c. Architect's project number.
 - d. Contractor's name and address.
 - e. Date of submittal.

2. Arrange schedule of values consistent with format of AIA Document G703.
 3. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division.
 - b. Description of the Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.
 - g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
 - 1) Labor.
 - 2) Materials.
 - 3) Equipment.
 4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
 - a. Include separate line items under Contractor and principal subcontracts for Project closeout requirements in an amount totaling five percent of the Contract Sum and subcontract amount.
 5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
 6. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.
 7. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
 8. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
 9. Purchase Contracts: Provide a separate line item in the schedule of values for each purchase contract. Show line-item value of purchase contract. Indicate owner payments or deposits, if any, and balance to be paid by Contractor.
 10. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
 - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
 11. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.
- 1.5 APPLICATIONS FOR PAYMENT
- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.

1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Times: Submit Application for Payment to Architect by the 5th of each month. Owner will make payment to the contractor in 30 calendar days. The period covered by each Application for Payment is one month, ending on the last day of the month.
 1. Submit draft copy of Application for Payment seven days prior to due date for review by Architect.
- D. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
- E. Application for Payment Forms: Use forms provided by Owner for Applications for Payment. Sample copies are included in Project Manual.
- F. Application for Payment Forms: Use forms acceptable to Architect and Owner for Applications for Payment. Submit forms for approval with initial submittal of schedule of values.
- G. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
 3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
 4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.
- H. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
 1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
 2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
 3. Provide summary documentation for stored materials indicating the following:
 - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
 - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
 - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- I. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

- J. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.
- K. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
 5. Waiver Forms: Submit executed waivers of lien on forms, acceptable to Owner.
- L. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Schedule of values.
 3. Contractor's construction schedule (preliminary if not final).
 4. Combined Contractor's construction schedule (preliminary if not final) incorporating Work of multiple contracts, with indication of acceptance of schedule by each Contractor.
 5. Products list (preliminary if not final).
 6. Schedule of unit prices.
 7. Submittal schedule (preliminary if not final).
 8. List of Contractor's staff assignments.
 9. List of Contractor's principal consultants.
 10. Copies of building permits.
 11. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 12. Initial progress report.
 13. Report of preconstruction conference.
 14. Certificates of insurance and insurance policies.
 15. Performance and payment bonds.
 16. Data needed to acquire Owner's insurance.
- M. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

- N. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 3. Updated final statement, accounting for final changes to the Contract Sum.
 4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
 5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
 6. AIA Document G707, "Consent of Surety to Final Payment."
 7. Evidence that claims have been settled.
 8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
 9. Notice of Completion of Public Works Contracts received from Public Works, L&I Contractor Release, and Employment Security Department.
- O. No final payment shall be made until (a) the Contractor provides to the Owner, prior to the acceptance of the Work, a notarized Certification of Compliance in the form attached hereto as Exhibit A; (b) the Contractor provides to the Owner the Contractor's drawings showing as-built changes and field markings; (c) the Contractor provides to the Owner two copies of the Operating and Maintenance Manuals for equipment and/or systems installed by the Contractor, if applicable; (d) the Owner receives the Certificates of Payments Received by the Washington State Department of Revenue, Employment Security and Labor & Industries; and (e) current status of Contractor's Workers' Comp account is verified.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 29 73 – SCHEDULE OF VALUES

PART 1 GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Make particular reference to the following sections:
 - 1. Section 00 72 00 – General Conditions
 - 2. Section 01 29 00 – Payment Procedures

1.2 FORMAT

- A. Contractors Schedule. Use AIA Document G703, or similar format approved by Owner

1.3 CONTENT

- A. **Contractor should allot the time necessary to prepare a complex schedule of values.** List the installed value of each major item of Work and each subcontracted item of Work as a separate line item to serve as a basis for computing values for Progress Payments. Round off values to nearest whole dollar. **If multiple buildings/projects are involved, prepare a separate schedule of values for each building/project. Under each separate schedule of values per building/project, subdivide the work into separate accounting categories, as directed by Owner.**
- B. Coordinate corresponding items listed by Schedule of Values with Construction Project Schedule required in Section 01 32 16.
- C. Use as basis for determining dollar value amount for each work activity and component of work for duration of Project.
- D. Make Schedule of Values total sum equal to current Contract Sum.
- E. Round-off figures to nearest dollar amount.
- F. Identify Schedule of Value line items to corresponding Section Titles in Project Manual Table of Contents.
- G. Break down each phase of the work for each specification section. For amounts greater than \$25,000 break down further by floor and further delineate by breaking floor into portions north, south, east and west with descriptive narrative.
- H. The Contractor will break out labor and material for Work in the public right-of-way and have separate line items for each item. The Contractor shall take actions, cooperate with, and provide the Owner with any requested information for the Owner to obtain a partial sales tax exemption for “public road construction” under RCW 82.08.050(9).
- I. Include separate lines for submission to Architect and Owner as identified in Section 00 72 00, Article 9, General Conditions.

1.4 SUBMITTAL

- A. Submit preliminary Schedule of Values to Architect within seven (7) days after issuance of Notice to Proceed. Form and content shall be acceptable to Architect and Owner. Transmit Schedule of Values using electronic transmittal process through email. Identify Project by title and Owner's Contract number.
- B. Preliminary Schedule of Values must be coordinated with the approved CPM Progress Schedule prior to application of the first progress payment and must be approved by Architect and Owner in its final form prior to application of second progress payment.
- C. Submit changes to Schedule of Values for approval with appropriate changes to the CPM Progress Schedule, showing approved Contract changes which affect payment requests.

1.5 SUBSTANTIATING DATA

- A. A. When Architect/Engineer requires substantiating information, submit data justifying line item amounts in question.
- B. Incorporate approved Schedule of Values into Application for Payment. Show percentage of work completed for each line item and corresponding amount earned by Contractor with each Application.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION 01 29 73

SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Coordination drawings.
 - 3. Requests for Information (RFIs).
 - 4. Project Web site.
 - 5. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.
- C. Related Requirements:
 - 1. Section 013200 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
 - 2. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 3. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.
 - 4. Section 019100 "General Commissioning" for coordinating the Work with Owner's Commissioning Authority.

1.3 DEFINITIONS

- A. RFI: Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Use CSI Form 1.5A. Include the following information in tabular form:
 - 1. Name, address, and telephone number of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.
 - 3. Drawing number and detail references, as appropriate, covered by subcontract.
- B. Key Personnel Names: Within 5 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
 - 1. Post copies of list in project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

1.5 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Coordination: Each contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each contractor shall coordinate its operations with operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 2. Coordinate installation of different components with other contractors to ensure maximum performance and accessibility for required maintenance, service, and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
- C. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of Contractor's construction schedule.
 2. Preparation of the schedule of values.
 3. Installation and removal of temporary facilities and controls.
 4. Delivery and processing of submittals.
 5. Progress meetings.
 6. Preinstallation conferences.
 7. Project closeout activities.
 8. Startup and adjustment of systems.
- E. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.
- 1.6 REQUESTS FOR INFORMATION (RFIS)
- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
 2. Project number.
 3. Name of Contractor.
 4. Name of Architect.
 5. RFI number, numbered sequentially.
 6. RFI subject.
 7. Specification Section number and title and related paragraphs, as appropriate.
 8. Drawing number and detail references, as appropriate.
 9. Field dimensions and conditions, as appropriate.
 10. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 11. Contractor's signature.
 12. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: AIA Document G716 Software-generated form with substantially the same content as indicated above, or forms acceptable to Architect.
1. Attachments shall be electronic files in PDF format.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow 10 working days for Architect's response for each RFI. RFIs received by Architect after 3:00 p.m. will be considered as received the following working day.
1. The following Contractor-generated RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Architect's actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 5 days of receipt of the RFI response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log at Owner Architect Contractor (OAC) Meeting or as requested by Owner or Architect. Use CSI Log Form 13.2B. Software log with not less than the following:
1. Project name.
 2. Name and address of Contractor.
 3. Name and address of Architect.
 4. RFI number including RFIs that were returned without action or withdrawn.
 5. RFI description.
 6. Date the RFI was submitted.
 7. Date Architect's response was received.

- F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.
 - 1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
 - 2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

1.7 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated. Alternating scheduled progress meeting shall be conducted via digital tele video technology such as ZOOM.
 - 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
 - 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 - 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.
- B. Preconstruction Conference: Architect will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
 - 1. Conduct the conference to review responsibilities and personnel assignments.
 - 2. Attendees: Authorized representatives of Owner Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 3. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing of Owner furnished Items and long-lead items.
 - d. Owner Furnished Contractor Installed Items
 - e. Designation of key personnel and their duties.
 - f. Lines of communications.
 - g. Procedures for processing field decisions and Change Orders.
 - h. Procedures for RFIs.
 - i. Procedures for testing and inspecting.
 - j. Procedures for processing Applications for Payment.
 - k. Distribution of the Contract Documents.
 - l. Submittal procedures.
 - m. Preparation of record documents.
 - n. Use of the premises.
 - o. Work restrictions.
 - p. Working hours.
 - q. Owner's occupancy requirements.
 - r. Responsibility for temporary facilities and controls.
 - s. Procedures for moisture and mold control.
 - t. Procedures for disruptions and shutdowns.
 - u. Construction waste management and recycling.

- v. Parking availability.
 - w. Office, work, and storage areas.
 - x. Equipment deliveries and priorities.
 - y. First aid.
 - z. Security.
 - aa. Progress cleaning.
4. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
- 1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
 - 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Review of mockups.
 - i. Possible conflicts.
 - j. Compatibility requirements.
 - k. Time schedules.
 - l. Weather limitations.
 - m. Manufacturer's written instructions.
 - n. Warranty requirements.
 - o. Compatibility of materials.
 - p. Acceptability of substrates.
 - q. Temporary facilities and controls.
 - r. Space and access limitations.
 - s. Regulations of authorities having jurisdiction.
 - t. Testing and inspecting requirements.
 - u. Installation procedures.
 - v. Coordination with other work.
 - w. Required performance results.
 - x. Protection of adjacent work.
 - y. Protection of construction and personnel.
 - 3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 - 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
 - 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

- D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 14 days prior to the scheduled date of Substantial Completion.
1. Conduct the conference to review requirements and responsibilities related to Project closeout.
 2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
 - a. Preparation of record documents.
 - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
 - c. Submittal of written warranties.
 - d. Requirements for completing documentation.
 - e. Requirements for preparing operations and maintenance data.
 - f. Requirements for delivery of material samples, attic stock, and spare parts.
 - g. Requirements for demonstration and training.
 - h. Preparation of Contractor's punch list.
 - i. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
 - j. Submittal procedures.
 - k. Coordination of separate contracts.
 - l. Owner's partial occupancy requirements.
 - m. Installation of Owner's furniture, fixtures, and equipment.
 - n. Responsibility for removing temporary facilities and controls.
 4. Minutes: Entity conducting meeting will record and distribute meeting minutes.
- E. Progress Meetings: Conduct progress meetings at weekly intervals. All meetings to provide digital tele video capabilities if in-person attendance is not required.
1. Coordinate dates of meetings with preparation of payment requests.
 2. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.

- 2) Sequence of operations schedule.
 - 3) Status of submittals.
 - 4) Status of documentation.
 - 5) Deliveries.
 - 6) Off-site fabrication.
 - 7) Access.
 - 8) Site utilization.
 - 9) Temporary facilities and controls.
 - 10) Progress cleaning.
 - 11) Quality and work standards.
 - 12) Status of correction of deficient items.
 - 13) Field observations.
 - 14) Status of RFIs.
 - 15) Status of proposal requests.
 - 16) Pending changes.
 - 17) Status of Change Orders.
 - 18) Pending claims and disputes.
 - 19) Documentation of information for payment requests.
4. Minutes: General Contractor will be responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
 - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.
- F. Coordination Meetings: Conduct Project coordination meetings at weekly intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.
1. Attendees: In addition to representatives of Owner, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work. Architect shall be invited to the meeting as needed to facilitate coordination questions.
 2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - b. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
 - c. Review present and future needs of each contractor present, including the following:
 - 1) Interface requirements.

- 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Work hours.
 - 10) Hazards and risks.
 - 11) Progress cleaning.
 - 12) Quality and work standards.
 - 13) Change Orders.
3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Startup construction schedule.
 - 2. Contractor's construction schedule.
 - 3. Construction schedule updating reports.
 - 4. Daily construction reports.
 - 5. Material location reports.
 - 6. Site condition reports.
 - 7. Special reports.
- B. Related Requirements:
 - 1. Section 013300 "Submittal Procedures" for submitting schedules and reports.
 - 2. Section 014000 "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
 - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.
- B. Cost Loading: The allocation of the schedule of values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum unless otherwise approved by Architect.
- C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
- D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- E. Event: The starting or ending point of an activity.
- F. Float: The measure of leeway in starting and completing an activity.
 - 1. Float time belongs to Owner.
 - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
 - 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
- G. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.4 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
 - 1. Working electronic copy of schedule file, where indicated.
 - 2. PDF electronic file.

- B. Startup construction schedule.
 - 1. Approval of cost-loaded, startup construction schedule will not constitute approval of schedule of values for cost-loaded activities.
 - C. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
 - D. Construction Schedule Updating Reports: Submit with Applications for Payment.
 - E. Daily Construction Reports: Submit at weekly intervals.
 - F. Material Location Reports: Submit at weekly intervals.
 - G. Site Condition Reports: Submit at time of discovery of differing conditions.
- 1.5 COORDINATION
- A. Coordinate Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from entities involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial Completion.
 - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Activities: Treat each story or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
 - 1. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
 - a. Insert list of major items or pieces of equipment.
 - 2. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
 - 3. Startup and Testing Time: Include no fewer than 15 days for startup and testing.
 - 4. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
 - 5. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and final completion.
- C. Work Restrictions: Show the effect of the following items on the schedule:
 - 1. Coordination with existing construction.
 - 2. Limitations of continued occupancies.
 - 3. Uninterruptible services.
 - 4. Partial occupancy before Substantial Completion.
 - 5. Use of premises restrictions.
 - 6. Provisions for future construction.
 - 7. Seasonal variations.
 - 8. Environmental control.

- D. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.
- E. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

2.2 CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Submit startup, horizontal, bar-chart-type construction schedule within seven days of date established for commencement of the Work the Notice to Proceed the Notice of Award.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 30 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

2.3 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
 - 1. List of subcontractors at Project site.
 - 2. List of separate contractors at Project site.
 - 3. Approximate count of personnel at Project site.
 - 4. Equipment at Project site.
 - 5. Material deliveries.
 - 6. High and low temperatures and general weather conditions, including presence of rain or snow.
 - 7. Accidents.
 - 8. Meetings and significant decisions.
 - 9. Unusual events (see special reports).
 - 10. Stoppages, delays, shortages, and losses.
 - 11. Meter readings and similar recordings.
 - 12. Emergency procedures.
 - 13. Orders and requests of authorities having jurisdiction.
 - 14. Change Orders received and implemented.
 - 15. Construction Change Directives received and implemented.
 - 16. Services connected and disconnected.
 - 17. Equipment or system tests and startups.
 - 18. Partial completions and occupancies.
 - 19. Substantial Completions authorized.
- B. Material Location Reports: At weekly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for stored materials:
 - 1. Material stored prior to previous report and remaining in storage.
 - 2. Material stored prior to previous report and since removed from storage and installed.
 - 3. Material stored following previous report and remaining in storage.
- C. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for

Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.4 SPECIAL REPORTS

- A. General: Submit special reports directly to Owner within one day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.
- B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Scheduling: Contractor shall employ skilled personnel with experience in scheduling and reporting techniques to create the construction schedule.
- B. Contractor's Construction Schedule Updating: At weekly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
 - 1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 - 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 - 3. As the Work progresses, indicate final completion percentage for each activity.
- C. Distribution: Distribute copies of approved schedule to Architect Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
 - 1. Post copies in Project meeting rooms and temporary field offices.
 - 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Requirements:
 - 1. Section 012900 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
 - 2. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
 - 3. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
 - 4. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
- C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.
- D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.4 ACTION SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.
 - 1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
 - 2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
 - 3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.

- a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.
 4. Format: Arrange the following information in a tabular format:
 - a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Submittal category: Action; informational.
 - d. Name of subcontractor.
 - e. Description of the Work covered.
 - f. Scheduled date for Architect's final release or approval.
 - g. Scheduled date of fabrication.
 - h. Scheduled dates for purchasing.
 - i. Scheduled dates for installation.
 - j. Activity or event number.
- 1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS
- A. Architect's Digital Data Files: Electronic digital data files of the Contract Drawings will be provided by Architect for Contractor's use in preparing submittals.
 1. Architect will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings and Project record drawings.
 - a. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
 - b. Digital Drawing Software Program: The Contract Drawings are available in pdf and AutoCAD.
 - c. Contractor shall execute a data licensing agreement in the form of Agreement form acceptable to Owner and Architect.
 - d. The following digital data files can be furnished upon request for each appropriate discipline:
 - 1) Floor plans.
 - 2) Reflected ceiling plans.
 - B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
 4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
 - C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 1. Initial Review: Allow 10 working days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.

2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Resubmittal Review: Allow 10 working days for review of each resubmittal.
 4. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 7 days for review of each submittal. Submittal will be returned to Architect before being returned to Contractor.
- D. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
 2. Name file with submittal number or other unique identifier, including revision identifier.
 - a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., PBC-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., PBC-061000.01.A).
 3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
 4. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Owner, containing the following information:
 - a. Project name.
 - b. Name and address of Architect.
 - c. Name of Construction Manager.
 - d. Name of Contractor.
 - e. Name of firm or entity that prepared submittal.
 - f. Names of subcontractor, manufacturer, and supplier.
 - g. Category and type of submittal.
 - h. Submittal purpose and description.
 - i. Specification Section number and title.
 - j. Specification paragraph number or drawing designation and generic name for each of multiple items.
 - k. Drawing number and detail references, as appropriate.
 - l. Location(s) where product is to be installed, as appropriate.
 - m. Related physical samples submitted directly.
 - n. Indication of full or partial submittal.
 - o. Transmittal number, numbered consecutively.
 - p. Submittal and transmittal distribution record.
 - q. Other necessary identification.
 - r. Remarks.
 5. Metadata: Include the following information as keywords in the electronic submittal file metadata:
 - a. Project name.
 - b. Number and title of appropriate Specification Section.
- E. Options: Identify options requiring selection by Architect.
- F. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the

Contract Documents, including minor variations and limitations. Include same identification information as related submittal.

- G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
 - 1. Note date and content of previous submittal.
 - 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 - 3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

PART 2 PRODUCTS

2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Contractor shall review and approve submittals prior to issuance to Architect. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
 - 1. Post electronic submittals as PDF electronic files directly to Architect's representative specifically established for Project.
 - a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
 - 2. Submit electronic submittals via email as PDF electronic files.
 - a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
 - 3. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
 - b. Provide a notarized statement on original paper copy certificates and certifications where indicated.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 - 1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 - 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams showing factory-installed wiring.

- b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 5. Submit Product Data before or concurrent with Samples.
 6. Submit Product Data in PDF format.
 - C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based on Architect's digital data drawing files is otherwise permitted.
 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 24 by 36 inches.
 3. Submit Shop Drawings in PDF format.
 - D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
 1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of applicable Specification Section.
 - e. Specification paragraph number and generic name of each item.
 3. For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
 4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
 5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.

6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit two sets of Samples. Architect will return one set. Mark up and retain one returned Sample set as a project record sample.
 - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
 1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
 2. Manufacturer and product name, and model number if applicable.
 3. Number and name of room or space.
 4. Location within room or space.
 5. Submit product schedule in PDF format.
- F. Coordination Drawing Submittals: Comply with requirements specified in Section 013100 "Project Management and Coordination."
- G. Contractor's Construction Schedule: Comply with requirements specified in Section 013200 "Construction Progress Documentation."
- H. Application for Payment and Schedule of Values: Comply with requirements specified in Section 012900 "Payment Procedures."
- I. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Section 014000 "Quality Requirements."
- J. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 017700 "Closeout Procedures."
- K. Maintenance Data: Comply with requirements specified in Section 017823 "Operation and Maintenance Data."
- L. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- M. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- N. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

- O. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- P. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- Q. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- R. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- S. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- T. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - 1. Name of evaluation organization.
 - 2. Date of evaluation.
 - 3. Time period when report is in effect.
 - 4. Product and manufacturers' names.
 - 5. Description of product.
 - 6. Test procedures and results.
 - 7. Limitations of use.
- U. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- V. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- W. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

2.2 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF electronic file paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
 - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Project Closeout and Maintenance Material Submittals: See requirements in Section 017700 "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

- A. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- B. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Submittals not required by the Contract Documents may be returned by the Architect without action.

END OF SECTION

CERTIFICATE OF COMPLIANCE

No final payment shall be made until the Contractor shall file with the Owner, prior to acceptance of the Work, a Certificate of Compliance in the following form:

The Contractor does hereby certify that all work on Pacific Building Conversion , has been performed and materials supplied in accordance with the drawings, specifications and Contract Documents for the above Work, and that:

No less than the prevailing rates of wages as ascertained by the governing body of the Contracting agency has been paid to laborers, workers and mechanics employed on this Work;

There have been no unauthorized substitutes of Subcontractors; nor have any Subcontractors been entered into without the names of the Subcontractors having been submitted to the Owner prior to the start of such subcontracted work;

No subcontract was assigned or transferred or performed by any Subcontractor other than the original Subcontractor, without prior notice having been submitted to the Owner together with the names of all Subcontractors;

All claims for material and labor and other service performed in connection with these specifications have been paid;

All monies due the State Industrial Accident Fund, the State Unemployment Compensation Trust Fund, the State Tax Commission, Hospital Associates and/or others have been paid.

In WITNESS WHEREOF, the undersigned has signed this instrument this ____ day of _____, 20____

Firm Name: _____

Signature: _____

Title: _____

(Attest) _____

(SEAL IF BIDDER IS A CORPORATION)

As determined necessary, evidence of compliance may be required to be submitted with and made a part of this Certificate of Compliance.

END OF CERTIFICATE OF COMPLIANCE SECTION

CERTIFICATE OF NO HAZARDOUS MATERIALS

No final payment shall be made until the Contractor shall file with the Owner, prior to acceptance of the Work, a notarized No Hazardous Materials Certificate in the following form for the Pacific Building Conversion project:

"TO THE BEST OF MY KNOWLEDGE NO HAZARDOUS MATERIAL INCLUDING BUT NOT LIMITED TO: ASBESTOS, PCB'S, MERCURY AND LEAD BASED PRODUCTS, WERE CONTAINED IN ANY PRODUCTS UTILIZED IN THE CONSTRUCTION OF THIS PROJECT. MATERIAL SAFETY DATA SHEETS (MSDS) WILL BE PROVIDED AS REQUESTED BY THE OWNER FOR ALL MATERIALS WHICH MAY BE QUESTIONED IN THE FUTURE."

In WITNESS WHEREOF, the undersigned has signed this instrument this ____ day of _____, 20____

Firm Name: _____

Signature: _____

Title: _____

(Attest) _____

(SEAL IF BIDDER IS A CORPORATION)

As determined necessary, evidence of compliance may be required to be submitted with and made a part of this Certificate.

END OF CERTIFICATE OF NO HAZARDOUS MATERIALS SECTION

SECTION 01 33 23 – SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

PART 1 GENERAL

1.1 DESCRIPTION

- A. Submit to the Architect with a copy to the Owner, shop drawings, product data and samples required by Specifications Sections.
- B. The Contractor shall prepare and submit to the Owner with the Construction Schedule, a separate schedule listing dates for submission of all required shop drawings, product data and samples.

1.2 SHOP DRAWINGS

- A. Original drawings, prepared by Contractor, Subcontractor, manufacturer, supplier or distributor, which illustrate some portion of the Work; showing fabrication, layout, setting or erection details.
- B. Shop drawings shall be prepared for this particular project. Drawings prepared specifically for other projects and revised for this project will be rejected.
 - 1. Present in clear and thorough manner. Title each drawing with Project name and number; identify each element of drawings by reference to sheet number and detail, schedule, or site location of Contract Documents.
 - 2. Identify field dimensions; show relation to adjacent or critical features or Work or products.
 - 3. Minimum Sheet Size: 8-1/2 x 11 inches.
 - 4. Do not submit free hand drawings.
 - 5. On shop drawings requiring Code Agency approval, submit on format and media required by Approval Agency. Include information required by Project Documents and Approval Agency.
- C. When necessary, base shop and setting drawings upon actual measurements taken at site and other job conditions. Show any variations and revisions to Contract Documents that are necessary for proper installation of work. Fabrication or installation of work shall not be started until shop or setting drawings have been checked and returned with "Reviewed" or "Note Markings" indicated by Architectural Consultant.
- D. Identify details by reference to sheet and detail numbers shown on Contract Drawings.

1.3 PRODUCT DATA

- A. Manufacturer's standard schematic drawings:
 - 1. Modify drawings to delete information which is not applicable to the Project.
 - 2. Supplement standard information to provide additional information applicable to project.
- B. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance chart, illustrations and other standard descriptive data.
 - 1. Clearly mark each copy and identify pertinent materials, products or models.

2. Show dimensions and clearances required.
3. Show performance characteristics and capacities.
4. Show wiring diagrams and controls.

1.4 SAMPLES

- A. Physical examples to illustrate materials, equipment or workmanship and to establish standards by which completed work is judged.
- B. Office Samples: Of sufficient size and quantity to clearly illustrate:
 1. Functional characteristics of product or material, with integrally related parts and attachment devices.
 2. Full range of color samples.
 3. After review, samples may be used in construction of Project.
- C. Field Samples and Mock-ups:
 1. Erect at product site at location acceptable to Owner.
 2. Construct each sample or mock-up complete, including Work of all trades required in finished Work.

1.5 CONTRACTOR RESPONSIBILITIES

- A. Review shop drawings, product data and samples prior to submission.
- B. Verify:
 1. Field measurements.
 2. Field Construction criteria.
 3. Catalog numbers and similar data.
- C. Coordinate each submittal with requirements of Work and Contract Documents.
- D. Contractor's responsibility for errors and omissions in submittals is not relieved by Architect's review.
- E. Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved by Architect's review of submittals.
- F. Notify the Owner and Architect, in writing at time of submission, of deviations in submittals from requirements of Contract Documents.
- G. Begin no work which requires submittals until return of submittals with Architect's stamp and initials or signature indicating review.
- H. After Architect's review, distribute copies.

1.6 SUBMITTAL REQUIREMENTS

- A. Make all submittals far enough in advance of scheduled dates for installation to provide all required time for review, for securing necessary approvals, for possible revision and resubmittals and for placing orders and securing delivery. Submission of all shop drawings shall be through the General Contractor.
- B. Submit number of samples specified in each specification section.
- C. Unless otherwise specifically permitted by the Architect, make all submittals in groups containing all associated items. Partial submittals may be rejected. Coordinate submittal to facilitate review of interrelated items.
- D. Make and deliver all submittals to Architect.
- E. Provide space for Contractor and Architect review stamps.
- F. Contractor must review and certify each submittal prior to submission to Architect.
- G. Reproduce and distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions. Pay all costs for reproduction, distribution and materials.
- H. Submit items requiring color selection with twenty (20) calendar days of Notice to Proceed. Colors will be selected after all color submittals are received by the Architect.
- I. For shop drawings larger than 11" x 17", submit one (1) reproducible unfolded transparency and two (2) opaque prints of shop drawings. For all other shop drawings and product data submit the number of copies which Contractor requires for distribution plus four (4) copies which will be retained by Architect and Owner.
- J. Accompany submittals with transmittal letter, in duplicate, containing:
 - 1. Date
 - 2. Project title and number
 - 3. Contractor's name and address
 - 4. The number of each shop drawing, product data and sample submitted
 - 5. Identification of submittal as it relates to:
 - a. Subcontractor/Supplier/Manufacturer:
 - 1) Name
 - 2) Address
 - 3) Telephone number
 - 4) Representative's name
 - b. Detail number and location in Construction Documents

- c. Specification reference number and paragraph
 - d. Applicable standards
 - e. Finishes
 - f. Identification of deviations from Contract Documents
- K. Except for indexed submittal binders such as mechanical or electrical submittals, provide one transmittal letter for each submittal dealing with a separate specification section. DO NOT include several different specification section submittals on one transmittal letter.
- 1. Submittals shall include:
 - a. Date and revision dates
 - b. Project title and number
 - 2. The name of:
 - a. Engineer
 - b. Contractor
 - c. Subcontractor
 - d. Supplier
 - e. Manufacturer
 - f. Separate detailer when pertinent
 - g. Identification of product or material
 - h. Relation to adjacent structure or materials
 - i. Field dimensions, clearly identified as such
 - j. Specifications section number
 - k. Applicable standards, such as ASTM number or Federal Specification
 - l. A blank space, for Engineer review stamp
 - m. Identification of deviations from Contract Documents
 - n. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of field measurements and compliance with Contract Documents.

1.7 RESUBMITTAL REQUIREMENTS

- A. Shop Drawings:
 - 1. Revise initial drawings as required and resubmit as specified for initial submittal.

2. Indicate on drawings any changes which have been made other than those requested by Architect.
3. Product data and samples: Submit new data and samples as required for initial submittal.

1.8 DISTRIBUTION OF SUBMITTALS AFTER REVIEW

- A. Distribute copies of shop drawings and product data which carry Architect's/Engineer's stamp, to:
 1. Contractor's file
 2. Job Site file
 3. Record Documents file
 4. Other prime Contractors
 5. Subcontractors
 6. Supplier
 7. Fabricator
 8. Engineer, two (2) copies
 9. Owner, two (2) copies

1.9 ARCHITECTS DUTIES

- A. Review submittals with reasonable promptness as mutually agreeable among the various parties.
- B. Review for:
 1. Design concept of project.
 2. Information given in Contract Documents
- C. Review of separate item does not constitute review of an assembly in which item functions.
- D. Affix stamp and initials or signatures certifying the review of submittal.
- E. Return submittals to Contractor for distribution.
- F. Deliver or send each item, shipping charges prepaid, to the Owner.
- G. The Architect or Owner may immediately reject any item without further review if it is not:
 1. Accompanied by a transmittal letter containing the required information.
 2. Submitted as a reproducible.
 3. Stamped "approved" by the Contractor.
- H. The review will be for conformance to the design concept and compliance with information given in the Contract Documents. The Architect will make notations directly on the reproducible.

- I. The review is intended to foresee unacceptable products and to avoid the possibility of their rejection at the site. The review shall not be construed as:
 - 1. Permitting a departure from the Contract Documents, unless specifically so noted.
 - 2. Relieving the Contractor of the responsibility for errors or omissions.
 - 3. Acceptance of an assembly in which an approved item is a part.
 - 4. Approval of variations from previously approved items.
 - 5. Approval of dimensions.
- J. The Architect will review all samples. Such review will be for appearance only. Compliance with all other requirements is the responsibility of the Contractor.
- K. Where the Contract Documents require the design of structural, mechanical or electrical systems or components of systems by a supplier, or where a Contractor initiates a change in the design of a system or component thereof, such systems or components shall be designed by a registered professional engineer and all calculations submitted to the Engineer for his records, prior to starting fabrication or installation of the Work. The Architect will not be responsible for the designs of such other professional engineers.

1.10 VARIATIONS FROM CONTRACT DOCUMENTS

- A. If the Architect determines a variation from the Contract Documents is in the best interest of the Owner, and it does not involve change in the Contract price or item, the Architect, with the Owner's concurrence, may permit such variation.
- B. Unless the Architect receives immediate written notification, he will assume the Contractor approves any variation shown.
- C. If the Contractor fails to mention variations from the Contract Documents, he will not be relieved of the responsibility for executing the Work in accordance with the Contract Documents.
- D. When a variation from the Contract Documents is permitted and such variation involves corresponding adjustment in an adjacent or related item, the responsibility for making and paying all costs for such adjustment rests with the Contractor requesting the original variation.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION 01 33 23

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
 - 4. Specific test and inspection requirements are not specified in this Section.

1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.
- C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
 - 1. Integrated Exterior Mockups: Mockups of the exterior envelope, consisting of multiple products, assemblies, and subassemblies.
- D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.
- E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- F. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
- G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
 - I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
 - J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- 1.4 CONFLICTING REQUIREMENTS
- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
 - B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.
- 1.5 ACTION SUBMITTALS
- A. Shop Drawings: For integrated exterior mockups, provide plans, sections, and elevations, indicating materials and size of mockup construction.
 - 1. Indicate manufacturer and model number of individual components.
 - 2. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.
- 1.6 INFORMATIONAL SUBMITTALS
- A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
 - B. Qualification Data : For Contractor's quality-control personnel.
 - C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems:
 - 1. Seismic-force-resisting system, designated seismic system, or component listed in the designated seismic system quality-assurance plan prepared by Architect.
 - 2. Main wind-force-resisting system or a wind-resisting component listed in the wind-force-resisting system quality-assurance plan prepared by Architect.
 - D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
 - E. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Entity responsible for performing tests and inspections.
 - 3. Description of test and inspection.
 - 4. Identification of applicable standards.
 - 5. Identification of test and inspection methods.

6. Number of tests and inspections required.
 7. Time schedule or time span for tests and inspections.
 8. Requirements for obtaining samples.
 9. Unique characteristics of each quality-control service.
- 1.7 CONTRACTOR'S QUALITY-CONTROL PLAN
- A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.
 - B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
 1. Project quality-control manager may also serve as Project superintendent.
 - C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
 - D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
 1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.
 2. Special inspections required by authorities having jurisdiction and indicated on the "Statement of Special Inspections."
 3. Owner-performed tests and inspections indicated in the Contract Documents, including tests and inspections indicated to be performed by the Commissioning Authority.
 - E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.
 - F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.
- 1.8 REPORTS AND DOCUMENTS
- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
 1. Date of issue.
 2. Project title and number.
 3. Name, address, and telephone number of testing agency.
 4. Dates and locations of samples and tests or inspections.
 5. Names of individuals making tests and inspections.
 6. Description of the Work and test and inspection method.
 7. Identification of product and Specification Section.
 8. Complete test or inspection data.
 9. Test and inspection results and an interpretation of test results.

10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 12. Name and signature of laboratory inspector.
 13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of technical representative making report.
 2. Statement on condition of substrates and their acceptability for installation of product.
 3. Statement that products at Project site comply with requirements.
 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 6. Statement whether conditions, products, and installation will affect warranty.
 7. Other required items indicated in individual Specification Sections.
- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of factory-authorized service representative making report.
 2. Statement that equipment complies with requirements.
 3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 4. Statement whether conditions, products, and installation will affect warranty.
 5. Other required items indicated in individual Specification Sections.
- D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.
- 1.9 QUALITY ASSURANCE
- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
 - B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
 - C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
 - D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
 - E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those

indicated for this Project.

- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
 - 1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
 - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
 - 1. Contractor responsibilities include the following:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
 - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
 - e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
 - f. When testing is complete, remove test specimens, assemblies, and mockups; do not reuse products on Project.
 - 2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
- K. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
 - 1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
 - 2. Notify Architect seven days in advance of dates and times when mockups will be constructed.

3. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed during the construction at Project.
4. Demonstrate the proposed range of aesthetic effects and workmanship.
5. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
 - a. Allow seven days for initial review and each re-review of each mockup.
6. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.

1.10 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
 2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.
 3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
 1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."
- D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

- F. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
 - 1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 - 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
 - 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 - 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 - 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 - 6. Do not perform any duties of Contractor.
 - G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
 - 1. Access to the Work.
 - 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 - 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 - 4. Facilities for storage and field curing of test samples.
 - 5. Delivery of samples to testing agencies.
 - 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 - 7. Security and protection for samples and for testing and inspecting equipment at Project site.
 - H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
 - 1. Schedule times for tests, inspections, obtaining samples, and similar activities.
 - I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses.
 - 1. Distribution: Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.
- 1.11 SPECIAL TESTS AND INSPECTIONS
- A. Special Tests and Inspections: Owner will engage a qualified special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, as indicated in Statement of Special Inspections attached to this Section, and as follows:
 - B. Special Tests and Inspections: Conducted by a qualified special inspector as required by authorities having jurisdiction, as indicated in individual Specification Sections and in Statement of Special Inspections attached to this Section, and as follows:
 - 1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviews the completeness and adequacy of those procedures to perform the Work.

2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
6. Retesting and reinspecting corrected work.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 ACCEPTABLE TESTING AGENCIES

- A. To be determined by Owner prior to construction start

3.2 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
 1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. Date test or inspection results were transmitted to Architect.
 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

3.3 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

SECTION 01 41 00 – REGULATORY REQUIREMENTS

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Description
- B. Applicable Codes and Ordinances
- C. Standards by Reference

1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. The General Conditions of the Contract and Supplemental General Conditions
- B. Refer to specific Sections in Division One.

1.3 DESCRIPTION

- A. This section states general regulation requirements and standards which apply to the construction of this Project.

1.4 APPLICABLE CODES AND ORDINANCES

- A. Comply will all governing laws, ordinances, statutes, rules, and regulations bearing on the conduct of the work as drawn and specified. This includes modifications, amendments, additions, and the like, current as of Bid date.
- B. Referenced codes establish minimum requirement levels. Where provisions of various codes or standards conflict, the more stringent provisions govern. Promptly submit to Architect written notice of observed contract document variations from legal requirements.
- C. Compliance requirements include, but are not limited to, the following:
 - 1. Seattle Building Code, 2015 Edition
 - 2. Seattle Existing Building Code, 2015 Edition
 - 3. Seattle and International Mechanical Code, 2015 Edition
 - 4. Seattle and International Fire Code, 2015 Edition
 - 5. Life Safety Code, Current Edition (reference code only)
 - 6. Seattle Plumbing Code, IAPMO, 2015 Edition
 - 7. State and City of Seattle Fire Marshall Requirements
 - 8. Seattle and National Electrical Code, 2017 Edition.
 - 9. Americans with Disabilities Act
 - 10. International Building Code for Barrier-Free Accessibility, WAC51

11. Wind Design Exposure: Exposure B / SDCI
 12. Seattle Energy Code, 2015 Edition
 13. Mechanical Work
 - a. Uniform Mechanical Code
 - b. Uniform Plumbing Code
 - c. National Fire Protection Association Codes
 - d. International Fire Code
 - e. State/Local Boiler Inspector
 - f. Factory Mutual (FM)
 - g. Industrial Risk Insurers (IRI)
 14. Electrical Work.
 - a. Underwriters' Laboratories (UL)
 - b. National Electrical Manufacturer's Association
 - c. NFPA, National Electrical Code (NEC), National Electric Safety Code, and above electrical listings as applicable
 - d. State Electrical Construction Code, WAC 296-46
 15. Elevator Work:
 - a. ANSI-A17.1 Safety Code for Elevators, dumbwaiters, escalators and moving walks, Current edition.
 - b. OSHA and State of Washington requirements/ elevators
 - 1) WAC 296-96, Safety Rules Governing Elevators, Dumbwaiters, Escalators and Lifting Devices—Moving Walks, Elevator Section, Current edition.
 16. Energy Requirements: Comply with insulation and energy conservation requirements of State of Washington, and 2015 Seattle Energy Code.
 17. Site and Site Utility Work
 - a. WSDOT-APWA: Current Standard Specifications for Road, Bridge, and Municipal Construction.
- D. Specifications of Higher Standards: Drawings and Specifications govern whenever higher standards are required than by governing codes, regulations, requirements or similar.

1.5 STANDARDS BY REFERENCE

SECTION 01 42 00 - REFERENCES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
 - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.4 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."
- B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. AABC - Associated Air Balance Council; www.aabc.com.
2. AAMA - American Architectural Manufacturers Association; www.aamanet.org.
3. AAPFCO - Association of American Plant Food Control Officials; www.aapfco.org.
4. AASHTO - American Association of State Highway and Transportation Officials; www.transportation.org.
5. AATCC - American Association of Textile Chemists and Colorists; www.aatcc.org.
6. ABMA - American Bearing Manufacturers Association; www.americanbearings.org.
7. ACI - American Concrete Institute; (Formerly: ACI International); www.concrete.org.
8. ACPA - American Concrete Pipe Association; www.concrete-pipe.org.
9. AEIC - Association of Edison Illuminating Companies, Inc. (The); www.aeic.org.
10. AF&PA - American Forest & Paper Association; www.afandpa.org.
11. AGA - American Gas Association; www.aga.org.
12. AHAM - Association of Home Appliance Manufacturers; www.aham.org.
13. AHRI - Air-Conditioning, Heating, and Refrigeration Institute (The); www.ahrinet.org.
14. AI - Asphalt Institute; www.asphaltinstitute.org.
15. AIA - American Institute of Architects (The); www.aia.org.
16. AISC - American Institute of Steel Construction; www.aisc.org.
17. AISI - American Iron and Steel Institute; www.steel.org.
18. AITC - American Institute of Timber Construction; www.aitc-glulam.org.
19. AMCA - Air Movement and Control Association International, Inc.; www.amca.org.
20. ANSI - American National Standards Institute; www.ansi.org.
21. AOSA - Association of Official Seed Analysts, Inc.; www.aosaseed.com.
22. APA - APA - The Engineered Wood Association; www.apawood.org.
23. APA - Architectural Precast Association; www.archprecast.org.
24. API - American Petroleum Institute; www.api.org.
25. ARI - Air-Conditioning & Refrigeration Institute; (See AHRI).
26. ARI - American Refrigeration Institute; (See AHRI).
27. ARMA - Asphalt Roofing Manufacturers Association; www.asphaltroofing.org.
28. ASCE - American Society of Civil Engineers; www.asce.org.
29. ASCE/SEI - American Society of Civil Engineers/Structural Engineering Institute; (See ASCE).
30. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers; www.ashrae.org.
31. ASME - ASME International; (American Society of Mechanical Engineers); www.asme.org.
32. ASSE - American Society of Safety Engineers (The); www.asse.org.
33. ASSE - American Society of Sanitary Engineering; www.asse-plumbing.org.
34. ASTM - ASTM International; (American Society for Testing and Materials International); www.astm.org.
35. ATIS - Alliance for Telecommunications Industry Solutions; www.atis.org.
36. AWEA - American Wind Energy Association; www.awea.org.
37. AWI - Architectural Woodwork Institute; www.awinet.org.
38. AWMAC - Architectural Woodwork Manufacturers Association of Canada; www.awmac.com.
39. AWPA - American Wood Protection Association; (Formerly: American Wood-Preservers' Association); www.awpa.com.
40. AWS - American Welding Society; www.aws.org.
41. AWWA - American Water Works Association; www.awwa.org.

42. BHMA - Builders Hardware Manufacturers Association; www.buildershardware.com.
43. BIA - Brick Industry Association (The); www.gobrick.com.
44. BICSI - BICSI, Inc.; www.bicsi.org.
45. BIFMA - BIFMA International; (Business and Institutional Furniture Manufacturer's Association); www.bifma.com.
46. BISSC - Baking Industry Sanitation Standards Committee; www.bissc.org.
47. BOCA - BOCA; (Building Officials and Code Administrators International Inc.); (See ICC).
48. BWF - Badminton World Federation; (Formerly: International Badminton Federation); www.bwfbadminton.org.
49. CDA - Copper Development Association; www.copper.org.
50. CEA - Canadian Electricity Association; www.electricity.ca.
51. CEA - Consumer Electronics Association; www.ce.org.
52. CFFA - Chemical Fabrics & Film Association, Inc.; www.chemicalfabricsandfilm.com.
53. CFSEI - Cold-Formed Steel Engineers Institute; www.cfsei.org.
54. CGA - Compressed Gas Association; www.cganet.com.
55. CIMA - Cellulose Insulation Manufacturers Association; www.cellulose.org.
56. CISCA - Ceilings & Interior Systems Construction Association; www.cisca.org.
57. CISPI - Cast Iron Soil Pipe Institute; www.cispi.org.
58. CLFMI - Chain Link Fence Manufacturers Institute; www.chainlinkinfo.org.
59. CPA - Composite Panel Association; www.pbmdf.com.
60. CRI - Carpet and Rug Institute (The); www.carpet-rug.org.
61. CRRC - Cool Roof Rating Council; www.coolroofs.org.
62. CRSI - Concrete Reinforcing Steel Institute; www.crsi.org.
63. CSA - Canadian Standards Association; www.csa.ca.
64. CSA - CSA International; (Formerly: IAS - International Approval Services); www.csa-international.org.
65. CSI - Construction Specifications Institute (The); www.csinet.org.
66. CSSB - Cedar Shake & Shingle Bureau; www.cedarbureau.org.
67. CTI - Cooling Technology Institute; (Formerly: Cooling Tower Institute); www.cti.org.
68. CWC - Composite Wood Council; (See CPA).
69. DASMA - Door and Access Systems Manufacturers Association; www.dasma.com.
70. DHI - Door and Hardware Institute; www.dhi.org.
71. ECA - Electronic Components Association; www.ec-central.org.
72. ECAMA - Electronic Components Assemblies & Materials Association; (See ECA).
73. EIA - Electronic Industries Alliance; (See TIA).
74. EIMA - EIFS Industry Members Association; www.eima.com.
75. EJMA - Expansion Joint Manufacturers Association, Inc.; www.ejma.org.
76. ESD - ESD Association; (Electrostatic Discharge Association); www.esda.org.
77. ESTA - Entertainment Services and Technology Association; (See PLASA).
78. EVO - Efficiency Valuation Organization; www.evo-world.org.
79. FM Approvals - FM Approvals LLC; www.fmglobal.com.
80. FM Global - FM Global; (Formerly: FMG - FM Global); www.fmglobal.com.
81. FRSA - Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.; www.floridarroof.com.
82. FSA - Fluid Sealing Association; www.fluidsealing.com.
83. FSC - Forest Stewardship Council U.S.; www.fscus.org.
84. GA - Gypsum Association; www.gypsum.org.
85. GANA - Glass Association of North America; www.glasswebsite.com.

86. GS - Green Seal; www.greenseal.org.
87. HI - Hydraulic Institute; www.pumps.org.
88. HI/GAMA - Hydronics Institute/Gas Appliance Manufacturers Association; (See AHRI).
89. HMMA - Hollow Metal Manufacturers Association; (See NAAMM).
90. HPVA - Hardwood Plywood & Veneer Association; www.hpva.org.
91. HPW - H. P. White Laboratory, Inc.; www.hpwhite.com.
92. IAPSC - International Association of Professional Security Consultants; www.iapsc.org.
93. IAS - International Approval Services; (See CSA).
94. ICBO - International Conference of Building Officials; (See ICC).
95. ICC - International Code Council; www.iccsafe.org.
96. ICEA - Insulated Cable Engineers Association, Inc.; www.icea.net.
97. ICPA - International Cast Polymer Alliance; www.icpa-hq.org.
98. ICRI - International Concrete Repair Institute, Inc.; www.icri.org.
99. IEC - International Electrotechnical Commission; www.iec.ch.
100. IEEE - Institute of Electrical and Electronics Engineers, Inc. (The); www.ieee.org.
101. IES - Illuminating Engineering Society; (Formerly: Illuminating Engineering Society of North America); www.ies.org.
102. IESNA - Illuminating Engineering Society of North America; (See IES).
103. IEST - Institute of Environmental Sciences and Technology; www.iest.org.
104. IGMA - Insulating Glass Manufacturers Alliance; www.igmaonline.org.
105. IGSHPA - International Ground Source Heat Pump Association; www.igshpa.okstate.edu.
106. ILI - Indiana Limestone Institute of America, Inc.; www.iliai.com.
107. Intertek - Intertek Group; (Formerly: ETL SEMCO; Intertek Testing Service NA); www.intertek.com.
108. ISA - International Society of Automation (The); (Formerly: Instrumentation, Systems, and Automation Society); www.isa.org.
109. ISAS - Instrumentation, Systems, and Automation Society (The); (See ISA).
110. ISFA - International Surface Fabricators Association; (Formerly: International Solid Surface Fabricators Association); www.isfanow.org.
111. ISO - International Organization for Standardization; www.iso.org.
112. ISSFA - International Solid Surface Fabricators Association; (See ISFA).
113. ITU - International Telecommunication Union; www.itu.int/home.
114. KCMA - Kitchen Cabinet Manufacturers Association; www.kcma.org.
115. LMA - Laminating Materials Association; (See CPA).
116. LPI - Lightning Protection Institute; www.lightning.org.
117. MBMA - Metal Building Manufacturers Association; www.mbma.com.
118. MCA - Metal Construction Association; www.metalconstruction.org.
119. MFMA - Maple Flooring Manufacturers Association, Inc.; www.maplefloor.org.
120. MFMA - Metal Framing Manufacturers Association, Inc.; www.metalframingmfg.org.
121. MHIA - Material Handling Industry of America; www.mhia.org.
122. MIA - Marble Institute of America; www.marble-institute.com.
123. MMPA - Moulding & Millwork Producers Association; (Formerly: Wood Moulding & Millwork Producers Association); www.wmmpa.com.
124. MPI - Master Painters Institute; www.paintinfo.com.
125. MSS - Manufacturers Standardization Society of The Valve and Fittings Industry Inc.; www.mss-hq.org.
126. NAAMM - National Association of Architectural Metal Manufacturers; www.naamm.org.

127. NACE - NACE International; (National Association of Corrosion Engineers International); www.nace.org.
128. NADCA - National Air Duct Cleaners Association; www.nadca.com.
129. NAIMA - North American Insulation Manufacturers Association; www.naima.org.
130. NBGQA - National Building Granite Quarries Association, Inc.; www.nbgqa.com.
131. NCAA - National Collegiate Athletic Association (The); www.ncaa.org.
132. NCMA - National Concrete Masonry Association; www.ncma.org.
133. NEBB - National Environmental Balancing Bureau; www.nebb.org.
134. NECA - National Electrical Contractors Association; www.necanet.org.
135. NeLMA - Northeastern Lumber Manufacturers Association; www.nelma.org.
136. NEMA - National Electrical Manufacturers Association; www.nema.org.
137. NETA - InterNational Electrical Testing Association; www.netaworld.org.
138. NFHS - National Federation of State High School Associations; www.nfhs.org.
139. NFPA - NFPA; (National Fire Protection Association); www.nfpa.org.
140. NFPA - NFPA International; (See NFPA).
141. NFRC - National Fenestration Rating Council; www.nfrc.org.
142. NHLA - National Hardwood Lumber Association; www.nhla.com.
143. NLGA - National Lumber Grades Authority; www.nlga.org.
144. NOFMA - National Oak Flooring Manufacturers Association; (See NWFA).
145. NOMMA - National Ornamental & Miscellaneous Metals Association; www.nomma.org.
146. NRCA - National Roofing Contractors Association; www.nrca.net.
147. NRMCA - National Ready Mixed Concrete Association; www.nrmca.org.
148. NSF - NSF International; (National Sanitation Foundation International); www.nsf.org.
149. NSPE - National Society of Professional Engineers; www.nspe.org.
150. NSSGA - National Stone, Sand & Gravel Association; www.nssga.org.
151. NTMA - National Terrazzo & Mosaic Association, Inc. (The); www.ntma.com.
152. NWFA - National Wood Flooring Association; www.nwfa.org.
153. PCI - Precast/Prestressed Concrete Institute; www.pci.org.
154. PDI - Plumbing & Drainage Institute; www.pdionline.org.
155. PLASA - PLASA; (Formerly: ESTA - Entertainment Services and Technology Association); www.plasa.org.
156. RCSC - Research Council on Structural Connections; www.boltcouncil.org.
157. RFCI - Resilient Floor Covering Institute; www.rfci.com.
158. RIS - Redwood Inspection Service; www.redwoodinspection.com.
159. SAE - SAE International; (Society of Automotive Engineers); www.sae.org.
160. SCTE - Society of Cable Telecommunications Engineers; www.scte.org.
161. SDI - Steel Deck Institute; www.sdi.org.
162. SDI - Steel Door Institute; www.steeldoor.org.
163. SEFA - Scientific Equipment and Furniture Association; www.sefalabs.com.
164. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (See ASCE).
165. SIA - Security Industry Association; www.siaonline.org.
166. SJI - Steel Joist Institute; www.steeljoist.org.
167. SMA - Screen Manufacturers Association; www.smainfo.org.
168. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.
169. SMPTE - Society of Motion Picture and Television Engineers; www.smpete.org.
170. SPFA - Spray Polyurethane Foam Alliance; www.sprayfoam.org.

171. SPIB - Southern Pine Inspection Bureau; www.spib.org.
 172. SPRI - Single Ply Roofing Industry; www.spri.org.
 173. SRCC - Solar Rating and Certification Corporation; www.solar-rating.org.
 174. SSINA - Specialty Steel Industry of North America; www.ssina.com.
 175. SSPC - SSPC: The Society for Protective Coatings; www.sspc.org.
 176. STI - Steel Tank Institute; www.steeltank.com.
 177. SWI - Steel Window Institute; www.steelwindows.com.
 178. SWPA - Submersible Wastewater Pump Association; www.swpa.org.
 179. TCA - Tilt-Up Concrete Association; www.tilt-up.org.
 180. TCNA - Tile Council of North America, Inc.; (Formerly: Tile Council of America); www.tileusa.com.
 181. TEMA - Tubular Exchanger Manufacturers Association, Inc.; www.tema.org.
 182. TIA - Telecommunications Industry Association; (Formerly: TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance); www.tiaonline.org.
 183. TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance; (See TIA).
 184. TMS - The Masonry Society; www.masonrysociety.org.
 185. TPI - Truss Plate Institute; www.tpinst.org.
 186. TPI - Turfgrass Producers International; www.turfgrasssod.org.
 187. TRI - Tile Roofing Institute; www.tilerroofing.org.
 188. UBC - Uniform Building Code; (See ICC).
 189. UL - Underwriters Laboratories Inc.; www.ul.com.
 190. UNI - Uni-Bell PVC Pipe Association; www.uni-bell.org.
 191. USAV - USA Volleyball; www.usavolleyball.org.
 192. USGBC - U.S. Green Building Council; www.usgbc.org.
 193. USITT - United States Institute for Theatre Technology, Inc.; www.usitt.org.
 194. WASTEC - Waste Equipment Technology Association; www.wastec.org.
 195. WCLIB - West Coast Lumber Inspection Bureau; www.wclib.org.
 196. WCMA - Window Covering Manufacturers Association; www.wcmanet.org.
 197. WDMA - Window & Door Manufacturers Association; www.wdma.com.
 198. WI - Woodwork Institute; (Formerly: WIC - Woodwork Institute of California); www.wicnet.org.
 199. WMMPA - Wood Moulding & Millwork Producers Association; (See MMPA).
 200. WSRCA - Western States Roofing Contractors Association; www.wsrca.com.
 201. WPA - Western Wood Products Association; www.wwpa.org.
- C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.
1. IAPMO - International Association of Plumbing and Mechanical Officials; www.iapmo.org.
 2. ICC - International Code Council; www.iccsafe.org.
 3. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.
- D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Information is subject to change and is up-to-date as of the date of the Contract Documents.
1. COE - Army Corps of Engineers; www.usace.army.mil.
 2. CPSC - Consumer Product Safety Commission; www.cpsc.gov.

3. DOC - Department of Commerce; National Institute of Standards and Technology; www.nist.gov.
 4. DOD - Department of Defense; <http://dodssp.daps.dla.mil>.
 5. DOE - Department of Energy; www.energy.gov.
 6. EPA - Environmental Protection Agency; www.epa.gov.
 7. FAA - Federal Aviation Administration; www.faa.gov.
 8. FG - Federal Government Publications; www.gpo.gov.
 9. GSA - General Services Administration; www.gsa.gov.
 10. HUD - Department of Housing and Urban Development; www.hud.gov.
 11. LBL - Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; <http://eetd.lbl.gov>.
 12. OSHA - Occupational Safety & Health Administration; www.osha.gov.
 13. SD - Department of State; www.state.gov.
 14. TRB - Transportation Research Board; National Cooperative Highway Research Program; www.trb.org.
 15. USDA - Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; www.ars.usda.gov.
 16. USDA - Department of Agriculture; Rural Utilities Service; www.usda.gov.
 17. USDJ - Department of Justice; Office of Justice Programs; National Institute of Justice; www.ojp.usdoj.gov.
 18. USP - U.S. Pharmacopeia; www.usp.org.
 19. USPS - United States Postal Service; www.usps.com.
- E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.
1. CFR - Code of Federal Regulations; Available from Government Printing Office; www.gpo.gov/fdsys.
 2. DOD - Department of Defense; Military Specifications and Standards; Available from Department of Defense Single Stock Point; <http://dodssp.daps.dla.mil>.
 3. DSCC - Defense Supply Center Columbus; (See FS).
 4. FED-STD - Federal Standard; (See FS).
 5. FS - Federal Specification; Available from Department of Defense Single Stock Point; <http://dodssp.daps.dla.mil>.
 - a. Available from Defense Standardization Program; www.dsp.dla.mil.
 - b. Available from General Services Administration; www.gsa.gov.
 - c. Available from National Institute of Building Sciences/Whole Building Design Guide; www.wbdg.org/ccb.
 6. MILSPEC - Military Specification and Standards; (See DOD).
 7. USAB - United States Access Board; www.access-board.gov.
 8. USATBCB - U.S. Architectural & Transportation Barriers Compliance Board; (See USAB).
- F. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.
1. CBHF - State of California; Department of Consumer Affairs; Bureau of Electronic Appliance and Repair, Home Furnishings and Thermal Insulation; www.bearhfti.ca.gov.

2. CCR - California Code of Regulations; Office of Administrative Law; California Title 24 Energy Code; www.calregs.com.
3. CDHS - California Department of Health Services; (See CDPH).
4. CDPH - California Department of Public Health; Indoor Air Quality Program; www.cal-iaq.org.
5. CPUC - California Public Utilities Commission; www.cpuc.ca.gov.
6. SCAQMD - South Coast Air Quality Management District; www.aqmd.gov.
7. TFS - Texas Forest Service; Forest Resource Development and Sustainable Forestry; <http://txforestservation.tamu.edu>.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 45 29 – TESTING LABORATORY SERVICES

PART 1 GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. The provisions and intent of the contract, including the General Conditions, and Division One Specification Sections apply to this work as if specified in this section. Work related to this section is described in:

1. Section 01 10 00 – Summary of Work

1.2 DESCRIPTION OF WORK

- A. The work of this section includes but is not limited to the following:
1. Performance criteria/specifications for work performed by the Contractor in addition to or as a supplement to the specific specification sections.
 2. Materials testing and analysis performed by a qualified testing laboratory hired by the Owner for the following general work categories: Concrete, Unit Masonry, Structural Steel, and Rough Carpentry.

1.3 REGULATORY REQUIREMENTS

- A. Conform to IBC Chapter 17 and building code authority having jurisdiction for requirements pertaining to structural tests and special inspections.
- B. Quality Assurance Plan for Each Seismic System: Prepared by Structural Engineer of Record, as shown on Structural Drawings, conforming to provisions of IBC Section 1705.
- C. Contractor's Statement of Responsibility: Submit prior to beginning work affected by Quality Assurance Plan.
1. Submittal Requirements:
 - a. Submit to Authority Having Jurisdiction and Owner.
 - b. Submit to Architect for review, conforming to Section 01 33 00, and prior to submitting to Authority Having Jurisdiction.
 2. Conform to IBC Section 1705 for written statement of responsibility for construction of each seismic-force-resisting system, designated seismic system, and component listed in Quality Assurance Plan.
 3. Conform to IBC Section 1705 for written statement of responsibility for construction of main windforce-resisting system or wind-resisting component listed in Quality Assurance Plan.

1.4 TESTING AND INSPECTION SERVICES

- A. Special Inspector Required by Code:
1. Employed by Owner.

2. Registered and approved by regulatory authority having local jurisdiction to conduct Special Inspections, testing, and laboratory services, required by IBC Chapter 17.
 3. Qualified as ACI Concrete Inspector Level II or equivalent for concrete inspections.
- B. Geotechnical (Soils) Engineer: Employed by Owner to conduct Special Inspections, including construction observation and soils engineering services, for work pertaining to soils, drainage, shoring, and related earthwork excavations, grading and filling to satisfy conformance to provisions of IBC Chapter 18 Soils and Foundations and Authority Having Jurisdiction.
- C. Envelope Consultant: Employed by Owner to conduct periodic on-site visual inspections for conformance with project specifications.
- D. Field Quality Control Testing, Inspection, and Laboratory Services:
1. Independent testing laboratory certified or accredited by qualifying agency or organization to perform testing, inspections, and provide laboratory services to verify conformance to reference standards and other specified provisions.
 2. Employed by Owner.

1.5 DUTIES OF TESTING AND INSPECTION SERVICES

- A. Special Inspector: Perform specified inspecting, sampling, and testing conforming to specified Reference Standards, provisions of Contract Documents, and requirements of IBC Section 1704 for Special Inspections.
- B. Geotechnical Engineer:
1. Perform inspection, testing, and verification of substrate conditions for foundations, slabs-on-grade, and other site construction.
 2. Perform inspection, testing, and verification of substrate conditions for storm water infiltration facilities, including rain gardens.
 3. Determine conditions requiring special procedures and make report to Owner and Architect detailing observed topographical conditions.
- C. Envelope Consultant: Perform weather tightness tests for all cladding and roofing, flashing, fascia and louvered assemblies in accordance with applicable ASTM tests. Will oversee work associated with Sections: 04 26 13 – Masonry Veneer; 07 26 16 – Below-Grade Vapor Retarder; 07 27 00 – Water-Resistive; Air Barrier Membrane; 07 52 00 – Modified Bituminous Membrane Roofing; 07 19 00 – Water Repellants & Anti-Graffiti Coating; Section 07 62 00 – Flashing and Sheet Metal; Section 07 92 00 – Joint Sealants; Section 08 11 10 – Hollow Metal Doors and Frames; and Section 08 80 00 – Glazing.
- D. Field Quality Control Testing, Inspection, and Laboratory Services: Perform specified field quality control testing of samples, mock-ups, and in-place work to verify conformance of manufactured products to that specified.
- E. Attend preconstruction and progress meetings and pre-installation conferences when requested.

- F. Promptly notify verbally and in writing, Architect, Owner, Contractor, and Building Code Official of observed irregularities and non-conformance to provisions of Contract Documents and requirements of IBC at time of discovery.

1.6 REPORTS BY TESTING AND INSPECTION SERVICES

- A. A. After each inspection and test, copies of field reports will be submitted to Owner, Architect, Contractor, and Building Department (when applicable) for filing with Contractor's Project Record Documents File.
- B. Notification of Noncompliance: Reports will be submitted to Owner, Architect, and Authority Having Jurisdiction (where applicable) of work not in compliance with Contract Documents or with IBC provisions.
- C. Include for Each Report:
 - 1. Date issued
 - 2. Project title and number
 - 3. Name of inspector
 - 4. Testing laboratory address, and telephone number
 - 5. Identification of product and specification Section and number
 - 6. Location of Project
 - 7. Record of weather conditions
 - 8. Date and time of sampling or inspection
 - 9. Date and type of test
 - 10. Location of sample or test in the Project
 - 11. Results of tests
 - 12. Compliance with Contract Documents
- D. Perform additional tests, requested by Authority Having Jurisdiction, Owner, or Architect. Owner will deduct from Contract Sum, cost of additional testing showing work in non-conformance with Contract Documents.

1.7 SPECIAL INSPECTOR AND TESTING INSPECTION LIMITS ON AUTHORITY

- A. Special Inspector, Testing Agencies, and Laboratory Services are not authorized to:
 - 1. Release, revoke, alter, or enlarge on requirements of Contract Document.
 - 2. Approve or accept work
 - 3. Assume or perform duties of Contractor
 - 4. Stop work or authorize additional work

1.8 GEOTECHNICAL ENGINEER LIMITS ON AUTHORITY

- A. Geotechnical Engineer may approve or reject some portions of the work and may recommend to Architect and Owner that the Contractor do work which may enlarge on or diminish Work.

1.9 CONTRACTOR RESPONSIBILITY

- A. Notification: Contractor shall notify inspection services and Architect a minimum of 24 hours in advance of any operations scheduled for inspection and/or testing specified herein, to allow for assignment of personnel and scheduling. Work requiring inspections and testing by testing laboratory will not be performed without their qualified inspector on the job site. If, after giving notice to the inspection services, the work requiring inspection and/or testing is not performed and the inspection services must make a second trip to the job site, the Contractor shall reimburse Owner for inspectors' time and travel expense. Where inspections and/or testing are required prior to Contractor starting work, Contractor shall arrange for inspections far enough in advance so as not to delay the project or cause inconvenience to the inspection services.
- B. Data: Contractor shall provide the inspection services with all product information, technical data, concrete design mix, grout design mix, mortar design mix, shop drawings, etc., as required by the inspection services for the proper execution of their work.
- C. Cooperation: Contractor shall cooperate with and assist inspectors in their work and provide the labor and materials required to:
 - 1. Provide safe access to work to be tested/inspected.
 - 2. To obtain and handle samples at the project site or at the source of the materials/product to be inspected/tested as deemed necessary by the inspection services.
 - 3. Facilitate inspections and tests.
 - 4. Provide light, power and/or water at location of inspection and/or as determined by testing laboratory.
- D. Non-Conforming Work:
 - 1. When test or inspections indicate non-conformance with the Contract Documents, subsequent re-testing occasioned by such non-conformance shall be performed by the same personnel as performed the initial tests or inspections, and the cost shall be paid for by the Contractor.
 - 2. Remove and replace any work found defective or not in conformance with the Contract Documents at no additional cost to the Owner and furnish notice for re-testing as specified hereinbefore.
- E. Contractor's Responsibility: The inspection services provided by the Owner shall not relieve the Contractor of his responsibility for compliance with the requirements of the Contract Documents. Inspections services are provided for the sole and exclusive benefit of the Owner in monitoring the quality and performance of the Contractor's work. Results of tests made by the Owner's inspectors will be made available to the Contractor and shall be a basis for rejection of non-conforming or defective work. Additional tests/inspections required by the Owner shall not be the basis for any claim by the Contractor for additional compensation.

1.10 TESTS AND INSPECTIONS – EARTHWORK

- A. Site Work including Earthwork:
 - 1. Identify unsuitable soils for excavation and removal.
 - 2. Testing and acceptance or rejection of on-site and imported material for use as structural fill.
 - 3. Preparation of subgrade surfaces.
 - 4. Placement and compaction testing of structural fill.
- B. Soils Compaction Tests: Conform to ASTM D 1557.
 - 1. Compacted Fills, Subgrades, and Base Courses: Minimum one test per 500 square feet for each lift.
- C. Special Grading, Excavations and Filling: Comply with IBC Chapter 18 and Appendix Chapter 33.
- D. Utility Trench Bottoms, Backfill of Utility Trenches: Minimum one test per 100 linear feet of trench for each lift.
- E. Soils Infiltration Tests: one per 1000 square feet of rain garden area.

1.11 SCHEDULE OF SOILS AND FOUNDATIONS INSPECTIONS

- A. Site work foundation and soils investigations conforming to IBC Chapter 18 and as specified by individual specification Sections will be conducted by Geotechnical Engineer. Additional testing will be performed as requested by Architect or Authority Having Jurisdiction.
- B. Site Work including Earthwork:
 - 1. Excavation of unsuitable material.
 - 2. Testing and acceptance or rejection of on-site and imported material for use as structural fill.
 - 3. Preparation of subgrade surfaces to receive additional fill, concrete footings, or concrete slabs.
 - 4. Placement and compaction testing of structural fill.
- C. Soils Compaction Tests: Conform to ASTM D 1557.
 - 1. Compacted Fills, Subgrades, Sub-Bases, and Base Courses (Other Than Interior Concrete Slabs-On-Grade): Minimum one test per 1000 square feet for each lift.
 - 2. Fills Under Interior Concrete Slabs-On-Grade: Minimum one test per 500 square feet for each lift.
 - 3. Fills Under Foundation Walls and Footings and Backfill of Foundation Walls and Footings: Not less than one test per 100 linear feet of wall footing for each lift.
- D. Special Grading, Excavations, and Filling: As specified by Section 31 10 00 – Site Preparation and as required by IBC Chapter 18.

- E. Utility Trench Bottoms, Backfill of Utility Trenches Under Concrete Slabs-on-Grade, Foundation Walls, and Asphalt Paving: Minimum one test per 100 linear feet of trench for each lift.

1.12 SCHEDULE OF STRUCTURAL TESTS AND SPECIAL INSPECTIONS

- A. Structural tests and special investigations, including special inspections and testing for seismic resistance required by IBC Chapter 17, and as specified by individual specification Sections, will be performed by Special Inspector. Additional testing will be performed as requested by Architect or Authority Having Jurisdiction. See General Structural Notes.

1.13 CONCRETE TESTS AND INSPECTIONS

- A. Concrete, General: As specified by Sections 03 30 00 – Cast-in Place Concrete, 03 37 13 – Shotcrete, and as required by IBC Section 1704.
- B. Reinforcing Steel:
 - 1. Prior to placing of reinforcing steel, verify that reinforcing complies with requirements of Structural Notes and Drawings.
 - 2. Verify grade, size, and placement of reinforcing steel, fabric, and embedded items prior to closing off by formwork and concrete or grout placement.
 - 3. Check condition of reinforcing and embedded items for bond integrity with concrete.
- C. Concrete Delivery and Placement:
 - 1. Check and keep record of batch tickets for compliance with required mix design.
 - 2. Remain on project site during placement of structural reinforced concrete.
 - 3. Prior to placement of concrete, Inspect:
 - a. Accuracy, configuration, and cleanliness of formwork.
 - b. Cleanliness, quantity, and placement of reinforcing steel.
- D. Aggregates for Normal Weight Concrete: Sample and perform Gradation Test to ASTM C33 on first day and every other day thereafter during course of construction.
- E. Testing and Sampling of Concrete Mix Water:
 - 1. Submit 1 test with the mix design.
 - 2. Submit 1 test each week during course of concrete placement.
 - 3. Test six cubes each test. 3 cubes with wash water and 3 cubes with potable water.
 - 4. Conduct chemical tests, 1 per week during course of concrete placement.
- F. Sampling for Concrete Compression Tests:
 - 1. Take representative samples of fresh concrete conforming to ASTM C172 for each concrete mix delivered to project.

- a. No samples are required for less than 5 cubic yards of concrete.
 - b. Take one sample for placement of 5 to 25 cubic yards.
 - c. Take one additional sample for each additional 150 cubic yards.
 - d. Minimum of one sample each day mix is delivered
2. Make and cure test 4 inch by 8 inch test cylinder specimens conforming to ASTM C31.

G. Concrete Compression Tests of Test Cylinders:

1. Test to ASTM C39 for each concrete mix conforming to following:

Age at Test (Days)	Number of Cylinders to be Tested and Broken	
	Acceptance Age: 56 Days	Acceptance Age: 28 Days
7	1	1
28	2	2
56	2	~
Hold	1	1

2. Basis for Compliance:
- a. Meet or exceed specified compressive strength for average of 3 consecutive strength tests for each concrete mix.
 - b. Individual strength test average of 2 cylinders does not fall more than 500 psi below specified compressive strength.
3. Test Report: Indicate exact mix tested, minimum aggregate size, location and type of concrete placement, cylinder identification, date of receiving test cylinder in laboratory, cement brand and type, and admixtures used.

H. In-Place Concrete Core Tests: Conduct further testing, at Contractor’s expense, of concrete where cylinder test cylinders fall 500 psi below specified compressive strength or where tests of field-cured cylinders indicate deficiencies in protection or curing.

- 1. Testing Procedure: Test to ASTM C42. Take at least three 2 inch diameter core samples from concrete placement locations considered questionable as instructed by Architect.
- 2. Damaged Core Samples: Replace samples damaged during removal or subsequent testing with new core sample.
- 3. Basis for Acceptance: Average compressive strength of core samples at least 85 percent of that specified and no single core sample less than 75 percent of that specified. Where not accepted, Structural Engineer analysis and correction of work will be made at Contractor’s expense.

- 4. Core Holes: Repair at Contractor's expense using accepted dry pack or specified non-shrink grout.
- I. Concrete Slump Tests: Make slump test for each batch delivered and at least 1 test each hour during continuous placements. Verify that batches are consistent. Test each batch to ASTM C143.
- J. Air Content: Test each set of concrete compression test cylinders to ASTM C231 at minimum one test each day.
- K. Concrete Curing Procedures: Conduct inspections and verify compliance with specified requirements.
- L. Anchors: Inspect epoxy anchors and expansion bolts installed in concrete as defined by IBC Chapter 17.

1.14 REINFORCING STEEL

- A. Reinforcing Bars: Placement of Reinforcing steel for concrete and grouting of solid grouted masonry.

1.15 MASONRY TESTS AND INSPECTIONS

- A. Structural Masonry and Masonry Veneer: As specified by Section 04 26 13, and as required by IBC Section 1704.
- B. Inspect grout spaces and cleanouts, take prism and test samples, inspect after placement of reinforcing steel, and during grouting operations, except as otherwise permitted by Code.

1.16 STRUCTURAL STEEL TESTS AND INSPECTIONS

- A. Structural Observations: Visual inspection of structural steel erections as define by IBC Section 1704.
- B. Structural Welding:
 - 1. Inspect welding of Structural Steel, reinforcing steel, and other members and connections designed to resist loads and forces required by Code, except that welding performed by approved fabricators as defined by IBC Section 1704 (AWS D1.1).
 - 2. Include non-destructive testing of welds required by IBC Section 1704 (AWS D1.1).
- C. High Strength Bolting: As required by IBC Section 1704.

1.17 MISCELLANEOUS TESTS AND INSPECTIONS

- A. Special Cases: As determined by Authority Having Jurisdiction or as requested by Architect or Owner.

1.18 CONTRACTOR'S QUALITY ASSURANCE/CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.

- B. Comply fully with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Comply with specified standards of minimum quality for Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship. Perform work by persons qualified to produce workmanship of specified quality.
- E. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.19 REFERENCES

- A. Conform to reference standard by date of issue current on the date of Contract Documents.
- B. Obtain copies of standards when required by Contract Documents.
- C. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Contractual relationship of parties to Contract shall not be altered from Contract Documents by mention or inference otherwise in any reference document.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION 01 45 29

SECTION 01 50 00 – CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division One Specifications, apply to this Section.

1.2 MOBILIZATION

- A. General:
 - 1. Contractor shall obtain and pay for all special permits and licenses and give all notices required for providing construction facilities and temporary controls.
 - 2. Construction facilities and temporary controls shall conform with applicable requirements of the following:
 - a. Associated General Contractors of America (AGC): Manual of Accident Prevention in Construction.
 - b. International Building Code (IBC): Applicable Chapters and Sections.
 - c. Kitsap County Building Code: Applicable Chapters and Sections.
 - 3. Maintain temporary facilities in proper and safe condition throughout progress of Work.
 - 4. Cost of all temporary facilities and controls to be paid by Contractor.

1.3 TEMPORARY UTILITIES AND FACILITIES

- A. General
 - 1. Provide and maintain temporary utilities for construction operations and temporary structures as required; remove on completion of Work.
 - 2. Comply with national Electrical Code.
 - 3. Comply with Federal, State, and local codes and regulation and with Owner and utility company requirements.
- B. Utilities
 - 1. Water and Electricity
 - a. Provide temporary water and electrical service during construction from existing building services. Provide any temporary connections required. Owner will pay for water and electric energy used at the building site.
 - b. Provide drinking water from a proven safe source for all those connected with the Work. Store water in such a manner as to keep it clean and fresh. Service in single service containers or sanitary drinking fountains.

2. Temporary Heat and Ventilation
 - a. Provide as required to maintain adequate environmental conditions to facilitate progress of Work. Use methods approved by Architect. Pay for all fuel and equipment.
 - b. Temporary heating equipment shall not exhaust products of combustion into the building interior. Comply with all state and local fire and safety codes for temporary heat.
 - c. Contractor may use the existing plant in lieu of temporary heat and ventilation specified. If permanent heating plant is used for temporary heat during construction the Contractor shall be responsible for thoroughly cleaning all ductwork of dust and similar contaminants resulting from construction.
 3. Temporary Toilets: Provide and maintain portable chemical toilets at locations approved by the Owner. Maintain in sanitary condition.
- C. Field Office Buildings(s)
1. Provide weathertight office building on site where directed. Provide good floor above ground, door with cylinder lock and large glazed window. Equip with shelving, plan racks, plan table, stools and chairs. Orient plan table so that drawings laid out will conform to actual directions. Provide sitting area for weekly meetings for 6 to 8 persons. Provide adequate heat, ventilation, and electric light and janitorial service. Provide for General Contractor and prime subcontractors. Pay for all utilities and telephone.
 2. Remove building and trailer from premises on completion of Work or sooner if directed.
- D. Enclosures
1. Provide and maintain for the duration of construction all scaffolds, tarpaulins, canopies, warning signs, steps, platforms, bridges, and other temporary construction necessary for proper completion of the Work in compliance with applicable safety and other regulations.
 2. Provide wood batten doors and cloth or transparent plastic covers for window, doors, exterior wall openings until the building is dry. Windows may be glazed if glazing is protected from damage. Protect all Work which is subject to abuse and wear prior to acceptance of the Contract and in conflict with Work of other trades.
 3. Hot kettles for roofing will be kept inside a temporary chain link fence during use and after hours. Coordinate location with Owner.
- E. Storage Facilities: Provide weathertight storage areas for materials requiring protection from weather. Provide separate weathertight storage building for any flammable liquids or other flammable materials.
- F. Fire Protection
1. Provide and maintain fire extinguishers, standpipes, fire hoses, and other equipment as necessary for proper fire protections, as required by authorities having jurisdiction, during construction period.

2. Take all necessary precautions to eliminate possible fire hazards and other property involved in or adjacent to the Project. Provide approved flammable storage facilities as required.
3. Do not store paint, paint thinners, gasoline, oil, or other flammable liquids within the building during construction.
4. Remove all combustible debris from inside the building at the close of each workday.
5. Cutting and welding operations are discouraged. If unavoidable, perform in strict accordance with requirements of NFPA pamphlet No. 51B "Standard For Fire Prevention During Welding, Cutting, And Other Hot Work".
6. Any operation of the Fire Alarm System shall be coordinated with the Owner.

1.4 CONSTRUCTION AIDS

A. General

1. Materials and installations may be new or used, suitable for the intended purpose, and in conformance with applicable regulatory requirements.
2. Provide, operate, and maintain a complete plant for fabricating, handling, conveying, installing and erecting all Work required under the Contract.
3. Maintain plant and equipment in safe and efficient operating condition. Contractor shall be responsible for damages due to defective plant and equipment and uses made thereof.

1.5 BARRIERS AND ENCLOSURES

A. Provide a suitable construction fence around Contractor's staging area and temporary barriers as required to prevent public entry into work areas. The construction fence shall remain, and be paid for by the Contractor, through construction of the Project to be removed at the end of this Contract.

1. All exterior barriers shall be continuous chain link fence, a minimum height of 72", with supporting posts at a minimum of 8 feet on center and include gates as appropriate for access to Work areas.
2. All interior barriers shall be continuous systems of 42" minimum height.

B. Provide temporary dust control partitions at locations indicated on the drawings. Minimum construction shall be rigid and reinforced polyethylene sheet material and closed joint and sealed edges at intersections with existing surfaces. Partition shall be in accordance with ASTM E90 and in accordance with ASTM E84 (maximum Flame Spread Rating of 75).

1.6 PROTECTIVE FACILITIES AND SAFETY MEASURES

A. Provide guardrails, handrails, and covers to floor, roof and wall openings and stairways, and erect temporary fencing and barricades as required to prevent entering into or passing through the construction area. Contractor is solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of the Work. This requirement will apply continuously and not be limited to normal working hours. The duty of the Architect to conduct construction observations of the Contractor's performance is not intended to include

review of the Contractor's safety measures, in, on or near the construction site. Contractor is responsible for compliance with "Safety and Health Regulations for Construction," Volume 36, No. 75, Part II of the Federal Register by the U.S. Department of Labor. Contractor is responsible for providing all such safety measures and consulting with the State or Federal safety inspector for interpretation whenever in doubt as to whether safe conditions do or do not exist or whether he is or is not in compliance with state and federal regulations.

1.7 TEMPORARY CONTROLS

- A. Temporary Controls: The Washington State Clean Air Act requires the use of all known, available, and reasonable means of controlling air pollution, including dust. Control dust generated during construction activities by wetting dust sources such as areas of exposed soil, washing truck wheels before they leave the site, and installing and maintaining gravel construction entrances. Construction vehicle track-out is also a major dust source. Any evidence of track-out can trigger violations and fines from the Department of Ecology or the Puget Sound Air Pollution Control Agency (SEFP Natural Environment/Air Quality Policies).
- B. Mitigation of Damages: During the construction protect all adjacent property and structures from damage due to and including, but not limited to, subsidence erosion and inundation. Mitigation of damages caused by Contractor's operations shall be the sole responsibility of the Contractor.

1.8 RESTORATION OF ROADS

- A. Unless otherwise specified or shown, resurface and bring to original grade and section roads in which the surface is removed, broken or damaged, or in which the ground has caved or settle during the work under this contract. Restore any curbs or gutters damaged during construction. Clean and repair roads used by the Contractor. Before resurfacing material is placed, trim edges of pavement back far enough to provide clean, solid, vertical faces, free of loose material.

1.9 SECURITY

- A. Contractor shall be responsible for the determination of and maintenance of proper security measures for the job site temporary facilities and construction zones of the building for the duration of the Construction Project until Owner assumes the responsibility, in writing (either at Substantial Completion or Final Completion. Contractor shall provide the following items: (The following list does not guarantee adequate security measures):
 - 1. Locks on all construction equipment boxes, temporary storage and office facilities, and construction equipment (vehicles, cranes, dozers, forklifts, etc.
 - 2. Temporary construction cores for all exterior and storage room doors, locksets or cylinders.
 - 3. Provide security and facilities to protect Work, and Owner's operations from unauthorized entry, vandalism, or theft.
 - 4. Maintain security site lighting systems.
 - 5. Restrict entrance of unauthorized persons and vehicles into construction areas.
 - 6. Maintain security of construction fencing and gates. Lock at the end of each working day.
- B. Contractor shall hold the Owner harmless from all damage, vandalism, stolen equipment or supplies on the Project site for whatever reason, or from injury to or death of unauthorized

person trespassing on Project Site because of inadequate security measures until the Owner releases the Contractor from security responsibilities in writing or at Final Completion, whichever comes first.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Chain-Link Fencing: Minimum 2-inch, 0.148-inch- thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts.
- B. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil (0.25-mm) minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.
- C. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches (914 by 1624 mm).
- D. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.
- E. All project signs and construction signs shall be fabricated from the following materials:
 - 1. Plywood Face: High density overlay type, with overlay 0.012" thick each side, 45% resin content by dry weight, and minimum with of 60 pounds/thousand sq. ft. of surface. 3/4" nominal plywood thickness shall be provided.
 - 2. Paint: Exterior, gloss, alkyd enamel. Provide 2 coats on all sign faces, backs and edges and 1 coat on all posts.
 - 3. Wood Posts: Douglas Fir, S4S, with design stress of 1400psi fb minimum. Paint the entire post before embedding in earth. Provide posts in sizes and depths of embedment as indicated.

2.2 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
 - 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 - 2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
 - 3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction.

4. Warranty of all equipment used for temporary use shall start at the date of Substantial Completion.

PART 3 EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

3.2 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
- B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations.
 1. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.
- C. Temporary Use of Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.
- D. Traffic Controls: Comply with requirements of authorities having jurisdiction.
 1. Protect existing site improvements to remain including curbs, pavement, and utilities.
 2. Maintain access for fire-fighting equipment and access to fire hydrants.
- E. Parking: Provide temporary parking areas for construction personnel.
- F. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
 1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
 2. Remove snow and ice as required to minimize accumulations.
- G. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
 1. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
 - a. Provide temporary, directional and safety signage for construction personnel and visitors.
 - b. Provide temporary signs and postings are required by the authority having jurisdiction.
 2. The Contractor shall provide the "Project Sign." Layout and design to include but not limited to:

- a. Building graphic image and owner's graphic logo.
 - b. Project Name
 - c. Owner's Name
 - d. Architect names.
 - e. Contractor's names
 - f. Area of plywood shall be 72" x 48" maximum
- H. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 01 73 00 "Execution."
- I. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.3 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.
- B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
1. Protect porous materials from water damage.
 2. Protect stored and installed material from flowing or standing water.
 3. Keep porous and organic materials from coming into prolonged contact with concrete.
 4. Remove standing water from decks.
 5. Keep deck openings covered or dammed.
- C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
 2. Keep interior spaces reasonably clean and protected from water damage.
 3. Periodically collect and remove waste containing cellulose or other organic matter.
 4. Discard or replace water-damaged material.
 5. Do not install material that is wet.
 6. Discard, replace, or clean stored or installed material that begins to grow mold.

7. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.

D. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:

1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
2. Use permanent HVAC system to control humidity.
3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.

3.4 OPERATION, TERMINATION, AND REMOVAL

A. Maintenance: Maintain facilities in good operating condition until removal.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

B. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

C. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 01 77 00 – Closeout Procedures.

END OF SECTION 01 50 00

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
 - 1. Section 012500 "Substitution Procedures" for requests for substitutions.
 - 2. Section 014200 "References" for applicable industry standards for products specified.

1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.4 ACTION SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
 - 2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within 5 working days of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 10 working days of receipt of request, or 5 working days of receipt of additional information or documentation, whichever is later.
 - a. Form of Approval: As specified in Section 013300 "Submittal Procedures."
 - b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 013300 "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
 - 1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
 - 2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 - 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.
- C. Storage:
 - 1. Store products to allow for inspection and measurement of quantity or counting of units.
 - 2. Store materials in a manner that will not endanger Project structure.
 - 3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
 - 4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
 - 5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
 - 6. Protect stored products from damage and liquids from freezing.
 - 7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
 - 1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 - 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."

PART 2 PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," Architect will make selection.
 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
 6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
- B. Product Selection Procedures:
1. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
- C. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 3. Evidence that proposed product provides specified warranty.

4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 61 10 – MATERIALS AND EQUIPMENT

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Definitions
- B. Transportation and Handling
- C. Storage and Protection
- D. Materials and Equipment
- E. Manufactured and Fabricated Products
- F. Preparation
- G. Installation
- H. Starting Systems

1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Make particular reference to the following Division One sections:
 - 1. Section 01 45 29 – Testing Laboratory Services: Product quality monitoring
 - 2. Section 01 78 23 – Operation and Maintenance Data
 - 3. Section 01 78 36 – Warranties and Bonds

1.3 DEFINITIONS

- A. Definition of "Products":
 - 1. "Products" include new material, machinery, components, equipment, fixtures, and systems forming Work.
 - 2. "Products" do not include machinery and equipment used for preparation, fabrication, conveying and erection of Work.
 - 3. "Products" may also include existing materials or components required for reuse.
- B. Comply with Specifications and referenced standards as minimum requirements.
- C. Components required to be supplied in quantity within a Specification section shall be the same and shall be interchangeable.
- D. Do not use materials and equipment removed from existing structure, except as specifically required, or allowed, by Contract Documents.

1.4 TRANSPORTATION AND HANDLING

- A. Coordinate product deliveries to avoid work schedule conflicts or delays.

- B. Transport and handle products in accordance with manufacturer's instructions.
- C. Deliver products undamaged, in manufacturer's original containers, with labels intact and legible.
- D. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.
- E. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

1.5 STORAGE AND PROTECTION

- A. Assume full responsibility for protection and safekeeping of products stored on premises.
- B. Store stockpiled materials in designated area.
- C. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate-controlled enclosures.
- D. For exterior storage of fabricated products, placed on sloped supports, above ground.
- E. Provide off-site storage and protection when site does not permit on-site storage or protection.
- F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.
- G. Store loose granular materials on solid flat surfaces in well-drained area. Prevent mixing with foreign matter.
- H. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- I. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under specified conditions.

PART 2 PRODUCTS

2.1 MATERIAL AND EQUIPMENT

- A. All materials and equipment shall be new (except existing items specifically designated for re-use) and free from defects impairing strength, durability, or appearances.
 - 1. When two or more items of same kind are required under work, use items of single manufacturer except where specifically exempted.
 - 2. Electrical products shall bear Underwriters' Laboratories (UL) label properly attached in accordance with requirements of Regulatory Agencies.
- B. All items incorporated into Work shall conform to Contract Documents and designated standards.

2.2 MANUFACTURED AND FABRICATED PRODUCTS

- A. Design, fabricate and assemble products in accordance with current best engineering, industry, and shop practices.
- B. Provide interchangeable components of same manufacturer, for similar components.
- C. Contract Documents are based upon specific manufacturers listed in various Specification sections. Alternate manufacturers may require deviations from Contract Documents to properly install their particular product and to provide required results.
 - 1. Provide all additional work necessary to install such products, if approved, at no extra charge to Owner.
 - 2. Submit Shop Drawings showing all deviations from Contract Documents for each specific item.

PART 3 EXECUTION

3.1 PREPARATION

- A. Examine existing conditions, Project requirements and Contract Documents. Verify that materials and equipment furnished meet specified requirements.

3.2 INSTALLATION

- A. Perform Work, handle, install, connect, clean, condition and adjust products in strict accordance with manufacturers' printed Instructions, and with Contract Document requirements.
- B. In case of conflict, Contract Documents shall govern. When in doubt, request clarification.

3.3 STARTING SYSTEMS

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Architect seven days prior to start-up of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, or other conditions which may cause damage.
- D. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify wiring and support components for equipment are complete and tested.
- F. Verify spaces and equipment have been cleaned from dust and debris prior to start-up of equipment.
- G. Execute start-up under supervision of responsible manufacturer's representative or Contractor's personnel in accordance with manufacturer's instructions.
- H. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.

- I. Submit a written report in accordance with the Contract Documents that equipment or system has been properly installed and is functioning correctly.

END OF SECTION 01 61 10

SECTION 01 63 10 – APPROVAL FOR SUBSTITUTION AND PRODUCT OPTIONS

PART 1 GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Substitutions During Bidding: Instructions for Bidders (Section 00 21 13).
- B. Shop Drawings, Product Data, Samples: General Conditions (Section 00 72 00) and Submittals (Section 01 33 00).

1.2 PRODUCTS LIST

- A. Within twenty-one (21) calendar days after date of Notice To Proceed, submit to the Architect five (5) copies of a complete list of all products which are proposed for installation.

1.3 CONTRACTOR'S OPTIONS

- A. For products specified only by reference standards, select any product meeting standards, by any manufacturer.
- B. For products specified by naming several products or manufacturers, select any product and manufacturer named.

1.4 SUBSTITUTIONS DURING BIDDING

- A. During bidding, the Architect will consider written requests for substitutions only when received in triplicate on the form provided at pages 01 63 10-4 and -5 at the end of this section. No request will be considered unless received at least twelve (12) calendar days prior to the bid date. Requests for substitutions after the bid date will be only considered if in conformance to specified Section 01 63 10-1.6.
- B. In connection with the use of any substitute item approved by the Architect and Owner, it shall be the Contractor's responsibility to see that such items meet all space requirements, and that any alterations to connecting items necessitated by use of the alternate items are properly made, at no increase in cost to the Owner.
- C. Specific reference in the specifications to any article, device, product, materials, form or type of construction, etc., by name, make or catalog number, shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition.
- D. In making request for substitution, Bidder/Contractor represents:
 - 1. He has personally investigated proposed product or method and determined that it is equal or superior in all respects to that specified.
 - 2. He will provide the same guarantee for substitution as for product or method specified.
 - 3. He will coordinate installation of accepted substitution into Work, making such changes as may be required for Work to be complete in all respects at no additional cost to Owner.
 - 4. He waives all claims for additional costs or time extensions related to substitution which consequently becomes apparent.

5. He will reimburse Owner for review or redesign services associated with re-approval by authorities.
- E. In order to allow the fullest competition, consistent with the Owner's interests, the Architect will give consideration, prior to submission of bids, to requests for approval of products and materials competitive with and similar to those specified by proprietary name.
- F. To be considered and in order to facilitate review of requests for approval of substitutions for specified products or materials, all such requests shall be made in writing on the form included as a part of this section.
- G. Should any proposed product substitution require any redesign work by the Architect's or the Architect's consultants to accommodate the substitute product, costs for such redesign work shall be included in the Bid amount and shall be paid to the Architect at the Architect's usual rates for the time expended in the required redesign work.

1.5 ARCHITECT'S OPTIONS

- A. Architect will be sole judge of acceptability of any proposed substitution.
- B. Only approved substitutions may be used on Contract Work.
- C. Each request for substitution approval shall include:
 1. Identity of product for which substitution is requested; include specification page and paragraph number.
 2. Identity of substitution; include complete product description, drawings, photographs, performance and test data, and any other information necessary for evaluation.
 3. Quality comparison of proposed substitution with specified product.
 4. Changes required in other work because of substitution.
 5. Effect on construction progress schedule.
 6. Cost comparison of proposed substitution with specified product.
 7. Any required license fees or royalties.
 8. Availability of local maintenance service.
 9. Source of replacement materials.

1.6 AFTER CONTRACT AWARD

- A. Approval will be granted only when:
 1. Specified product cannot be delivered without project delay, or
 2. Specified product has been discontinued, or
 3. Specified product has been replaced by superior product, or

4. Specified product cannot be guaranteed as specified, or
5. Product will not perform properly, or
6. Specified product will not fit within designated space, or
7. Specified product does not comply with governing codes or regulations, or
8. Substitution determined by the Owner to be in his best interest.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION 01 63 10

SECTION 01 65 10 – DELIVERY, STORAGE, AND HANDLING

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Requirements
- B. Delivery
- C. Product Handling
- D. Storage
- E. Maintenance of Storage
- F. Protection After Installation
- G. Damaged Products

1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Make particular reference to the following Division One sections:
 - 1. Section 01 10 00 – Summary of Work
 - 2. Section 01 31 13 – Project Coordination
 - 3. Section 01 50 00 – Construction Facilities and Controls

1.3 REQUIREMENTS

- A. Provide for expeditious transportation and delivery of products to project site undamaged and on a schedule to avoid delay of the work.
- B. Provide equipment and personnel at the site to unload and handle products in a manner to avoid damage to products.
- C. Provide secure storage and protection for products to be incorporated into the work, and maintenance and protection for products after installation and until completion of the work.
- D. Store materials in accordance with manufacture’s environmental requirements and instructions.

1.4 DELIVERY

- A. Arrange deliveries of products in accord with construction progress schedules and in ample time to facilitate inspection prior to installation.
- B. Coordinate deliveries to avoid conflict with work and conditions at site.
 - 1. Work of other contractors, or Owner.
 - 2. Limitations of storage space.
 - 3. Availability of equipment and personnel for handling products.

- C. Deliver products in undamaged condition in original containers or packaging, with identifying labels intact and legible.
- D. Partial deliveries of component parts of equipment shall be clearly marked to identify the equipment, to permit easy accumulation of parts and to facilitate assembly.
- E. Immediately upon delivery, inspect shipment to assure:
 - 1. Product complies with requirements of Contract Documents and reviewed submittals.
 - 2. Quantities are correct.
 - 3. Containers and packages are intact, labels are legible.
 - 4. Products are properly protected and undamaged. Minor damages may be repaired, provided the finish items are equal in all respects to new work.

1.5 PRODUCT HANDLING

- A. Provide equipment and personnel necessary to handle products, including those provided by Owner, by methods to prevent soiling or damage to products or packaging.
- B. Provide additional protection during handling as necessary to prevent scraping, marring, or otherwise damaging products or surrounding surfaces.
- C. Handle products by methods to prevent bending or overstressing.
- D. Lift heavy components only at designated lifting points.

1.6 STORAGE

- A. Store products immediately on delivery and protect until installed in the work. Store in accordance with manufacturer's environmental requirements and instructions, with seals and labels intact and legible.
- B. Store products subject to damage by elements in substantial weather-tight enclosures.
 - 1. Maintain temperatures within ranges required by manufacturer's instructions.
 - 2. Provide humidity control for sensitive products, as required by manufacturer's instructions.
 - 3. Store unpacked products on shelves, in bins, or in neat piles, accessible for inspection.
- C. Exterior Storage:
 - 1. Provide substantial platforms, blocking, or skids to support fabricated products 4" above ground, prevent soiling or staining.
 - 2. Cover products, subject to discoloration or deterioration from exposure to the elements, with impervious sheet coverings. Avoid use of non-vented plastic or canvas shelters which could create humidity chambers. Provide adequate ventilation to avoid condensation.
 - 3. Store loose granular materials on solid surfaces such as paved areas or provide plywood or sheet materials to prevent mixing with foreign matter.

- a. Provide surface drainage to prevent flow or ponding of rainwater.
- b. Prevent mixing of refuse or chemically injurious materials or liquids.

1.7 MAINTENANCE OF STORAGE

- A. Maintain periodic system of inspection of stored products on schedules basis to assure that:
 1. State of storage facilities is adequate to provide required conditions.
 2. Required environmental conditions are maintained on continuing basis.
 3. Surfaces of products exposed to elements are not adversely affected. Any weathering of products, coatings, and finishes is not acceptable under requirement of Contract Documents.

1.8 PROTECTION AFTER INSTALLATION

- A. Provide protection of installed products to prevent damage from subsequent operations. Remove when no longer needed, prior to completion of work.
- B. Control traffic to prevent damage to equipment and surfaces.
- C. Provide coverings to protect finished surfaces from damage.

1.9 DAMAGED PRODUCTS

- A. Damaged or deteriorated materials shall be removed from the premises. Replace materials which have been damaged.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION 01 65 10

SECTION 01 73 00 - EXECUTION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. Installation of the Work.
 - 4. Cutting and patching.
 - 5. Coordination of Owner-installed products.
 - 6. Progress cleaning.
 - 7. Starting and adjusting.
 - 8. Protection of installed construction.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for limits on use of Project site.
 - 2. Section 013300 "Submittal Procedures" for submitting surveys.
 - 3. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
 - 4. Section 024119 "Selective Demolition" for demolition and removal of selected portions of the building.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 QUALITY ASSURANCE

- A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
 - 1. Contractor is required to allow Owner to inspect all walls, ceilings, all finished spaces and all elements therein to validate the quality of the work and the presence and location of all required elements in the walls, ceilings and all finished spaces.
 - 2. Concealed Elements: Contractor is required to allow Owner to inspect all work before it is concealed.
 - 3. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
 - 4. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:
 - a. Primary operational systems and equipment.

- b. Fire separation assemblies.
 - c. Air or smoke barriers.
 - d. Fire-suppression systems.
 - e. Mechanical systems piping and ducts.
 - f. Control systems.
 - g. Communication systems.
 - h. Fire-detection and -alarm systems.
 - i. Conveying systems.
 - j. Electrical wiring systems.
 - k. Operating systems of special construction.
5. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:
- a. Water, moisture, or vapor barriers.
 - b. Membranes and flashings.
 - c. Exterior curtain-wall construction.
 - d. Sprayed fire-resistive material.
 - e. Equipment supports.
 - f. Piping, ductwork, vessels, and equipment.
 - g. Noise- and vibration-control elements and systems.
6. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- B. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.
- C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 2. Owner will have the option to inspect all walls before Gypsum board is applied.
 3. No existing and abandoned items (i.e. plumbing lines, gas lines, electrical conduit) will be left in place. All existing items will be removed and disposed of.
 4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 5. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 6. Owner will examine all concealed spaces before wall face or ceilings are installed. Contractor will let owner know in weekly construction meetings when concealed spaces will be available for inspection.
- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
1. Description of the Work.
 2. List of detrimental conditions, including substrates.
 3. List of unacceptable installation tolerances.
 4. Recommended corrections.
- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.
- 3.2 PREPARATION
- A. Existing Utility Information: Furnish information to Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 013100 "Project Management and Coordination."
- 3.3 CONSTRUCTION LAYOUT
- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.

- B. Storage of all construction tools and materials will be maintained in/on locations that have been approved by owner prior to commencement of construction activities.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.
- F. Contractor will secure and lock all supplies and tools at the end of each day in the designated contractor laydown areas. Owner is not responsible for tools or supplies that go missing. No tools or supplies will be left in the construction area without prior owner approval.
 - 1. Work taking place inside of the Existing Emergency Department or adjacent areas on the first floor must take place between 6:00 am and 4:00 PM and be scheduled through owner.
 - 2. Limit conduct of especially noisy work to hours designated by Owner.
 - 3. Construction in the basement must first be coordinated with the owner. In essence the rooms will need to be scheduled through owner for construction activity. Contractor should anticipate at least one weeks' notice to schedule rooms.

3.4 FIELD ENGINEERING

- A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
 - 1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
 - 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- B. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
 - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
 - 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
 - 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
- C. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.
 - 1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.

2. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 1. Make vertical work plumb and make horizontal work level.
 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
 4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. NVH Permits. A standing "Hot Works Permit" will be permitted to the contractor for work inside the construction zone. Any work outside the construction zone, i.e., inside the existing hospital, will require Hot Works Permit for each instance of that work and any time the contractor works above the ceiling in the existing facility, they will be required to take out an Above-Ceiling Work Permit. These are secured through the Facilities office.
- D. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- E. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- F. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- G. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- H. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- I. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 2. Allow for building movement, including thermal expansion and contraction.
 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- J. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- K. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
- F. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 6. Proceed with patching after construction operations requiring cutting are complete.
- G. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint

coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.

4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- H. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 OWNER-INSTALLED PRODUCTS

- A. Site Access: Provide access to Project site for Owner's construction personnel.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.
 1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
 2. Preinstallation Conferences: Include Owner's construction personnel at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

3.8 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
 4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 1. Remove liquid spills promptly.
 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 017419

"Construction Waste Management and Disposal."

- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.9 STARTING AND ADJUSTING

- A. Coordinate startup and adjusting of equipment and operating components with requirements in Section 019113 "General Commissioning."
- B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- E. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

3.10 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION

SECTION 01 73 29 – CUTTING AND PATCHING

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Submittals
- B. Materials
- C. Extent of Work
- D. Existing Conditions
- E. Preparation
- F. Performance
- G. Cutting Structural Framing
- H. Cleaning and Repairing
- I. Surfaces Coated with Lead-Based Paint

1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Make particular reference to the following Division One sections:
 - 1. Section 01 10 00 – Summary of Work
 - 2. Section 01 63 10 – Approval for Substitution and Product Options

1.3 SUBMITTALS

- A. Work Procedures: Written description of Contractor's work procedures that demonstrate techniques for minimizing dust generation at the sources; confining dust and other contamination; protecting mechanical equipment, ductwork, fans, and the like from dust contamination; cleaning following demolition; and surface preparation. Work procedures shall define means and methods to protect workers and adjacent area occupants from lead dust, testing procedures, and shall demonstrate compliance with all State of Washington requirements contained in WAC 296-155-176 "Lead Exposure in Construction". The procedures shall be subject to review and approval by the Owner's hazardous material consultant and must be revised accordingly. Contractor shall follow all requirements of the plan.
- B. Submit written request for cutting approval to Architect well in advance of any cutting which affects:
 - 1. Work of Owner or any separate contractor.
 - 2. Structural value or integrity of any completed or existing work.
 - 3. Waterproof value or integrity of any weather-exposed or moisture resistant work.
 - 4. Efficiency, operational life, maintenance, or safety of any completed or existing work.

5. Visual qualities of any sight-exposed work.

C. Request shall include:

1. Project identification.
2. Location and Description of affected work.
3. Necessity for cutting, alteration, or excavation.
4. Effect on Owner's or separate contractor's work.
5. Effect on structural or weatherproof integrity on completed or existing work.
6. Description of proposed work including:
 - a. Extent of cutting, patching, alteration, or excavation.
 - b. Trades who will execute work.
 - c. Products proposed for use.
 - d. Extent of required refinishing.
7. Alternative to cutting and patching.
8. Cost proposal, when applicable.

D. Submit written notice to Architect designating date and time when work will be performed.

1.4 QUALITY ASSURANCE

- A. Visual Requirements: Perform cutting and patching in manner as approved by Architect to maintain aesthetic qualities. Cut and patch in manner so as to leave no visual evidence.
- B. Products Specified by Project Manual: Perform cutting and patching in conformance with specified requirements of applicable Sections.
- C. Structural Work: Conform to Structural requirements for cutting of structural members. Do no cutting of structural elements that could reduce structural load capacity, deflection ratio, or integrity of structural systems without prior direction from Structural Engineer.
- D. Obtain approval by submitting Cutting and Patching Proposal before cutting:
 1. Foundation construction.
 2. Bearing and retaining walls.
 3. Structural concrete.
 4. Structural steel.
 5. Structural decking.
 6. Stair systems.

7. Miscellaneous structural metal fabrications.
 8. Equipment support including for piping, ductwork, and equipment.
- E. Fire Suppression; Plumbing; Heating, Ventilating and Air Conditioning; and Electrical Work: Refer to the requirements of Division 21, Division 22, Division 23, and Division 26.

1.5 QUALIFICATIONS

- A. Cutting: Employ skilled and experienced workers to perform cutting.
- B. Patching:
 1. Employ skilled installers and applicators, conforming to qualifications of Sections specifying materials and systems being patched.
 2. Where products to be patched are not specified within Project Manual, employ skilled workers specializing in work to be patched, as instructed by Architect.

PART 2 PRODUCTS

2.1 MATERIALS

- A. For products similar to those specified elsewhere in this Project Manual: Follow those Specifications.
- B. For other Products: Follow Architect's instructions.
- C. For any change in materials, submit request for substitution under provisions of Section 01 63 10.

PART 3 EXECUTION

3.1 EXTENT OF WORK

Perform all cutting, fitting, and patching, including attendant excavation and backfill, required to complete Work or to:

- A. Make Work fit properly together.
- B. Uncover Work for installation of ill-timed work.
- C. Remove and replace defective Work and Work not conforming to Contract Documents.
- D. Remove samples of installed Work for testing.
- E. Provide penetrations through non-structural surfaces for mechanical and electrical Work.

3.2 EXISTING CONDITIONS

- A. Inspect existing conditions and identify Work subject to damage or movement caused by proposed cutting and patching.
- B. After uncovering Work, inspect conditions affecting products installation or performance.

- C. Report unsatisfactory and questionable conditions to the Architect in writing; do not proceed with work until further instructions are provided.
- D. Beginning of cutting and patching implies acceptance of existing conditions.

3.3 PREPARATION

- A. Maintain adequate temporary support necessary to assure structural integrity of affected work; provide devices and methods to protect other portions of project from damage.
- B. Protect work exposed by cutting against damage and discoloration.
- C. Provide protection from elements for areas which may be exposed by uncovering work; maintain excavations free of water.

3.4 PERFORMANCE

- A. Provide proper surfaces for repairs.
- B. Employ qualified installer or fabricator to perform cutting and patching of:
 - 1. Weather-exposed or moisture-resistant surfaces.
 - 2. Sight-exposed finished surfaces.
- C. Restore cut or removed work with new products to provide work complete in accordance with Contract Documents. At penetrations of fire-rated wall, ceiling, or floor construction, completely seal voids with fire-rated material, full thickness of the construction element. Provide required fire-resistant rating.
- D. Fit work air-tight to pipes, sleeves, ducts, conduits, and other surface penetrations.
- E. Where patching occurs, refinish entire surface to provide even finish to match adjacent work as follows:
 - 1. Continuous surfaces: refinish to nearest intersection.
 - 2. Assemblies: refinish entire unit.

3.5 CUTTING STRUCTURAL FRAMING

- A. Execute cutting by methods to avoid damage to portions of work to remain and to provide surfaces appropriate for patching and finishing. Where possible, review proposed cutting with original installer. Obtain, and follow manufacturer's installation instructions.
- B. Use hand tools or small power equipment designed for sawing or grinding, not hammering or chopping.
- C. Cut holes, slots, and saw cuts to obtain clean cuts and even lines in sizes and areas as necessary to complete work with no evidence of patching.
- D. Cut concrete, masonry and other such rigid materials using masonry carborundum saw or diamond core drill. Do not use pneumatic tools without prior approval from Architect.

- E. Cut or drill from exposed or finished side into concealed side to avoid marring finished surfaces.
- F. Protect existing construction & installed work to prevent trade damage.

3.6 PATCHING

- A. Employ original installer where possible or conform to specified qualifications where not applicable for weather exposed and moisture resistant elements, and sight-exposed surfaces.
- B. Perform work in manner to achieve least evidence of patching and as necessary to achieve unblemished, uniform appearance.
- C. Match finish of patched material. Where necessary, refinish to nearest joint, intersection, natural break, or adjoining construction to eliminate evidence of patching.
- D. Patch miscellaneous holes, gouges, scrapes, penetrations and other damaged surfaces on existing construction.
- E. Patch using durable materials and methods, suitable to physical characteristics, tolerances, and expansion coefficients of materials being patched.
- F. Where cutting or removal of existing material results in uneven finished surfaces, such as at floors, walls, and ceilings, perform work to establish even, uniform surface of same color and pattern as original work. Where not practical or obtainable, proceed as instructed by Architect.
- G. Where patching occurs at painted surface, extend paint finish coating over entire unbroken surface. Recoat as necessary to conform to appearance requirements of Section 09 91 00 – Painting.
- H. Patch to maintain fire-resistive construction at construction joints, voids, openings, and penetrations.

3.7 ADJUSTING

- A. Make repairs or replace cutting and patching work not conforming to specified requirements.
- B. Repair damage to work resulting from work of this Section. Where instructed by Architect, reimburse Owner for damage to original construction, deducted from Contract Sum.

3.8 CLEANING AND REPAIRING

- A. Including work of other Sections, clean, repair, and touchup, or replace when directed, products which have been soiled, discolored, or damaged by work of this Section.
- B. Remove debris from Project Site upon work completion or sooner, if required by Owner.

END OF SECTION 01 73 29

SECTION 01 74 00 – CONSTRUCTION CLEANING

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Submittals
- B. Periodic Cleaning
- C. Cleaning Prior to Substantial Completion
- D. Cleaning Prior to Final Completion

1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Make particular reference to the following Division One sections:
 - 1. Section 00 72 00 – General Conditions
 - 2. Section 01 50 00 – Construction Facilities and Temporary Controls
 - 3. Section 01 74 19 – Construction Waste Management

1.3 SUBMITTALS

- A. GENERAL
 - 1. Submit the name and resume of the company or individuals performing final cleaning. Cleaning crew shall be experienced professional cleaners trained in special procedures required by this section.
 - 2. Submit a written final cleaning work plan including specific procedures for each task required by the work. Final cleaning plan shall include a timeline showing completion of all cleaning tasks prior to Substantial Completion deadline. Utilization of any work shift outside of the normal workday shall be identified.
 - 3. Final cleaning operations may require the cleaning of dusts and debris associated with demolition/construction activities that impacted lead-containing paints.

1.4 PERIODIC CLEANING

- A. Responsibilities
 - 1. For the duration of the Work, Contractor shall:
 - a. Keep the Project site free of waste materials, debris, and rubbish and maintain the Project site in a clean and orderly condition.
 - b. Clean and remove all debris, rubbish, and dust from pipe chases, plenums, crawl spaces, and other closed or remote spaces, prior to closing the space.

- c. Periodically clean all Work areas to provide suitable and safe conditions for Work. Maintain the site in a neat and orderly condition at all times to the satisfaction of the Owner.
 - d. Conform to Section 01 74 19 for Construction Waste Management in disposing of construction and salvage material.
 - e. Clean and remove all debris, rubbish and dust from any spaces that was accessed by contractors under this scope of work. Spaces includes all existing rooms & ceiling spaces accessed. Prior to staffs return, all spaces to be returned to like condition prior to contractor access.
 - f. Broom clean interior areas prior to start of surface finishing, and continue cleaning on an as-needed basis.
 - g. Control cleaning operations so that dust and other particulates do not adhere to wet or newly coated surfaces.
 - h. Protect lawn and landscaped areas from broken glass. All glass removed from the exterior walls must be removed from the job site.
2. Environmental Requirements
- a. Contractor shall comply fully with federal and local environmental and anti-pollution regulations, and shall remove waste materials from the site and dispose of them in a lawful manner.
 - b. Contractor shall not dispose of volatile wastes such as mineral spirits, oil, paint thinner, or other harmful materials in storm or sanitary drains.
 - c. Burning or burying of debris, rubbish, or other waste material is not permitted at the Project site.
 - d. Maintain continuous cleaning and wetting procedures to control dust pollution at project site and haul routes as required by governing authorities and the Contract Documents. Use power sweepers for street cleaning.
 - e. Vacuum (HEPA type filter), clean and wipe interior surfaces of building at the completion of work in each area or weekly, whichever is more frequent. Cover all desks, tables, work surfaces with drop clothes to minimize contamination. Remove drop cloths once work is complete and dispose in a manner to avoid contamination of Work area. Continue vacuum cleaning on as-needed basis until building is ready for Substantial Completion or occupancy. Do not sweep area that can be vacuumed.
 - f. Schedule cleaning so that resultant dust and contaminants will not fall on wet or newly coat surfaces.
 - g. Contractor shall take measures to ensure dust does not infiltrate heating and ventilation system.
 - h. Contractor shall take measures to ensure dust does not infiltrate into areas of the building outside the work zone.

1.5 CLEANING PRIOR TO SUBSTANTIAL COMPLETION

A. General

1. Contractor shall employ experienced workers or professional cleaners for final cleaning.
2. Contractor shall complete the following cleaning operations before requesting inspection for Substantial Completion of the Work:
 - a. Remove labels that are not required as permanent labels.
 - b. Clean transparent materials, including mirrors and glass in doors and windows, to a polished condition. Remove putty and other substances, which are noticeable as vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
 - c. Clean all finishes so they are free of dust, stains, films, and similar noticeable distracting substances. Restore reflective surfaces to their original reflective condition. Leave concrete floor broom clean. Vacuum carpeted surfaces. Damp mop resilient floor coverings.
 - d. Wipe surfaces of mechanical and electrical equipment clean. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
 - e. Remove all construction debris and clean mechanical and/or electrical equipment rooms and attic areas. Wipe surfaces of all equipment clean.
 - f. Clean the Project site, including landscape development areas, of rubbish, litter, and other foreign substances. Sweep paved areas to a broom clean condition; remove stains, spills, and other foreign deposits. Rake grounds that are neither paved nor planted to a smooth even-textured surface.
 - g. Clean the work/staging areas, including landscape areas, of rubbish, litter and foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake clean any lawn or landscape areas. Restore damaged landscaping to condition existing prior to construction.
 - h. Clean all finished surfaces, including but not limited to:
 - 1) Clean light globes, tubes & lens;
 - 2) Wash interior walls;
 - 3) Strip, seal, and apply two coats of finish to all vinyl tile and sheet goods with approved material and method;
 - 4) Clean white boards;
 - 5) Clean baseboards;
 - 6) Wash and dry furniture;
 - 7) Remove dust and debris form all exposed surfaces;
 - 8) Clean clocks;

- 9) Wash windows, inside and out;
- 10) Clean windowsills and frames;
- 11) Wash sinks;
- 12) Wash restrooms walls and partitions;
- 13) Wash and treat stainless sinks; and/or
- 14) Check traps and drains under sinks; and as needed:
 - 1 Clean outside of unit ventilators;
 - 2 Clean exterior building walls/walkways and overhangs;
 - 3 Wash and dry walk off mats;
 - 4 Vacuum and remove stain from carpets; and/or
 - 5 Hot water extract carpets.
- 15) Remove waste materials from the site and dispose of in a lawful manner. Do not use Owner's containers for trash generated by cleaning or construction.

B. Pest Control

1. Contractor shall engage an experienced exterminator to make a final inspection of the Work, and to rid the Project site of rodents, insects, and other pests. Submit report with closeout documents.

C. Removal of Protection

1. Except as otherwise indicated or requested by the Owner, Contractor shall remove any temporary protection devices and facilities installed during the course of the Work to protect previously completed Work for the remainder of construction.

1.6 CLEANING PRIOR TO FINAL COMPLETION

A. General

1. General cleaning during construction is required by the General Conditions and included in Section 01 50 00.

B. Interior

1. Cleaning is required in all spaces affected by construction activities of the Work.
2. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

3. Complete the following cleaning operations before requesting inspection for Certificate of Substantial Completion. Any areas outside the work zone where construction dust infiltrated shall be cleaned to the same standard as new work.
 - a. Remove labels that are not permanent labels.
 - b. Remove protective coatings and/or films from all accessories.
 - c. Clean transparent materials, including mirrors and glass in doors and windows (inside and outside). Remove glazing compound and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Restore reflective surfaces to their original reflective condition.
 - d. Clean exposed finishes to a dust-free condition, free of stains, films and similar foreign substances. Mop all resilient floors.
 - e. Clean dust collecting surfaces hidden from view to a dust-free condition. Scope includes, but is not limited to the following: tops of cabinets or shelves; high dusting of pipes, ductwork, light fixtures, beams, moldings, window or door trim, conduits, raceways, junction boxes, etc. Clean dust and foreign debris from mechanical closets, utility and service rooms within the work zone.
 - f. Clean light fixtures and lamps.
 - g. Clean plumbing fixtures to a sanitary condition.
 - h. Wet mop all resilient floors.
 - i. Vacuum carpeted surfaces and clean consistent with manufacturers recommendations for installation.
- C. Exterior
1. Complete the following operations before requesting inspection for Certification of Substantial Completion:
 - a. Clean the work/staging areas, including landscape areas, of rubbish, litter and foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake clean any lawn or landscape areas. Restore damaged landscaping to condition existing prior to construction.
 - b. At roof areas, remove asphalt, paint and other foreign matter from sheet metal work, equipment, building side walls, skylights and other associated surfaces. Clean skylights inside and out. Remove debris from gutters, downspouts, drainage system, shafts, equipment vaults, closets and similar spaces.
 - c. Removal of Protection: Remove temporary protection and facilities installed for protection of the Work during construction.
 - d. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of

in a lawful manner. Do not use Owner's containers for trash generated by cleaning or construction.

- D. Contractor shall re-clean all areas of the Project site affected by punch-list Work and Contractor's activities at the Project site between Substantial and Final Completion.

PART 2 PRODUCTS

2.1 EQUIPMENT

- A. Contractor shall provide covered containers for deposit of waste materials, debris, and rubbish for the duration of the Work.

2.2 CLEANING AGENTS

- A. Contractor shall use cleaning materials and agents recommended by the manufacturer or fabricator of the surface to be cleaned. Contractor shall not use cleaning agents that are potentially hazardous to health or property, or that might damage finished surfaces. Contractor shall submit all Material Safety Data Sheets and maintain a MSDS binder on site for the duration of the Work.
- B. Provide all required personnel, equipment, and materials needed to maintain specified standard of cleanliness
- C. All vacuum cleaners used on the project shall be equipped with high efficiency particulate air (HEPA) filtration system capable of trapping and retaining at least 99.97% of monodisperse diethylphthalate (DOP) particles have a mean particle diameter of 0.3 micrometer.

PART 3 EXECUTION – NOT USED

END OF SECTION 01 74 00

SECTION 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous demolition and construction waste.
 - 2. Recycling nonhazardous demolition and construction waste.
 - 3. Disposing of nonhazardous demolition and construction waste.
- B. Related Requirements:
 - 1. Section 024119 "Selective Demolition" for disposition of waste resulting from partial demolition of buildings, structures, and site improvements, and for disposition of hazardous waste.

1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.4 ACTION SUBMITTALS

- A. Waste Management Plan: Consult with Owner regarding Salvaging, recycling and disposal of construction and demolition waste. Wherever possible recycle construction and/or demolition waste.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management process as agreed with Owner. plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
- B. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
 - 2. Comply with Section 015000 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 SALVAGING DEMOLITION WASTE

- A. Salvaged Items for Reuse in the Work: Salvage items for reuse and handle as follows:

1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
 3. Store items in a secure area until installation.
 4. Protect items from damage during transport and storage.
 5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.
- B. Salvaged Items for Sale and Donation: Are not permitted on Project site. Owner will have first right of refusal on all salvaged waste material. Salvaged waste cannot be stored on site.
- C. Salvaged Items for Owner's Use: Salvage items for Owner's use and handle as follows:
1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
 3. Store items in a secure area until delivery to Owner.
 4. Transport items to Owner's storage area designated by Owner.
 5. Protect items from damage during transport and storage.
- D. Doors and Hardware: Brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.
- E. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.
- F. Plumbing Fixtures: Separate by type and size.
- G. Lighting Fixtures: Separate lamps by type and protect from breakage.
- H. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.
- 3.3 RECYCLING CONSTRUCTION WASTE
- A. Packaging:
1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 2. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 3. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
- B. Wood Materials:
1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
 2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.
- 3.4 DISPOSAL OF WASTE
- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction. No construction waste can be sold or given away on the project site.
1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.

- C. Disposal: Remove waste materials and dispose of at designated spoil areas on Owner's property.
- D. Disposal: Remove waste materials from Owner's property and legally dispose of them.

END OF SECTION

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Repair of the Work.
- B. Related Requirements:
 - 1. Section 017300 "Execution" for progress cleaning of Project site.
 - 2. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 3. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.3 ACTION SUBMITTALS

- A. Product Data: For cleaning agents.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.4 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Field Report: For pest control inspection.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.6 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
 - 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.

4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number where applicable.
 - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect's signature for receipt of submittals.
 5. Submit test/adjust/balance records.
 6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Advise Owner of pending insurance changeover requirements.
 2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 3. Complete startup and testing of systems and equipment.
 4. Perform preventive maintenance on equipment used prior to Substantial Completion.
 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 017900 "Demonstration and Training."
 6. Advise Owner of changeover in heat and other utilities.
 7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
 8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 9. Complete final cleaning requirements, including touchup painting.
 10. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for final completion.
- 1.7 FINAL COMPLETION PROCEDURES
- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."
 2. Contractor shall submit all prevailing wage affidavits for the history of the project.
 3. Contractor shall submit to owner a set of record drawings not all changes from design that were incorporated during construction.
 4. Contractor shall submit to Owner lien releases for general contractor and all sub-contractors.

5. Before final payment can be released, Washington State Labor and Industries, Washington Department of Revenue and Washington State Employment Security, must have released contractor from its respective responsibilities.
 6. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 7. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 8. Submit pest-control final inspection report.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
- 1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)
- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction. Use CSI Form 14.1A or other forms acceptable to Architect.
1. Organize list of spaces in sequential order.
 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Name of Architect.
 - c. Name of Contractor.
 - d. Page number.
 4. Submit list of incomplete items in the following format:
 - a. PDF electronic file. Architect will return annotated file.
- 1.9 SUBMITTAL OF PROJECT WARRANTIES
- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.

3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
 4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove snow and ice to provide safe access to building.
 - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - h. Sweep concrete floors broom clean in unoccupied spaces.
 - i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
 - j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - k. Remove labels that are not permanent.
 - l. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

- m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - o. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
 - 1) Clean HVAC system in compliance with NADCA Standard 1992-01. Provide written report on completion of cleaning.
 - p. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
 - q. Leave Project clean and ready for occupancy.
- C. Pest Control: Comply with pest control requirements in Section 015000 "Temporary Facilities and Controls." Prepare written report.
- D. Construction Waste Disposal: Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls." Section 017419 "Construction Waste Management and Disposal."

3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
 - 1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
 - 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
 - 3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
 - 4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION

CLOSEOUT CHECKLIST

PROJECT: _____ **SUBSTANTIAL COMPLETION DATE:** _____
 _____ **FINAL COMPLETION DATE:** _____
 _____ **PROJECT NO.:** _____

Item No.	Item Description: *Note: Shaded items (1-20) are required under closeout of contractor's contract.	Complete (Initial)
1	Letter from Contractor stating the Work is complete (Section 01 77 00, 1.4, A)	
2	Signed permits noting field inspections (copy), if applicable	
3	Certificate of Occupancy issued, if applicable	
4	Certificate of Substantial Completion from Architect (Section 01 77 00, 1.3, D)	
5	Letter by Contractor stating punchlist items complete	
6	Statement of Apprenticeship participation form (projects over \$1M)	
7	Certificate of Insurance renewal or letter by Contractor and Insurer (Section 00 72 00)	
8	Consent of Surety Compliance (Section 01 77 00)	
9	Certificate of Compliance	
10	Certificate of No Hazardous Materials	
11	O&M Manuals including warranties to Architect or Owner (transmittal)	
12	Completed preventative maintenance inventory sheet, if applicable	
13	As-Builts to Architect or Owner (transmittal)	
14	Spare parts, extra materials, etc., delivered to Owner (transmittal)	
15	Required training complete – dates and topics	
16	Contractor's Affidavit of Payment of Debts and Claims (i.e. AIA Document G706-1994)	
17	Contractor's Affidavit Release of Liens (i.e. AIA Document G706A-1994)	
18	Affidavit of Wages Paid to Department of Labor and Industries (Section 01 77 00, 1.6, A, 3)	
19	State of Washington Notice of Completion of Public Works contract form	
20	Final 100% Pay Application from Contractor (Section 01 77 00, 1.10, A)	
21	Final Testing and Balance Report, if applicable	
22	Field Lighting Test Report, if applicable	
23	Final Commissioning Report and letter of acceptance by Agent, if applicable	
24	Letter from Architect stating square footage, new and old, and all Work is completed in accordance with Contract Documents, if applicable	
25	Memo from Project Manager recommending Final Acceptance	
26	Board of Commissioners Action Report/Final Acceptance	
27	Notice of Completion Preparation of Project with L&I, Employment Security, and DOR	

REVIEWED AND COMPLETED:

APPROVED AND ACCEPTED:

PRINTED NAME

PRINTED NAME

SIGNATURE

SIGNATURE

TITLE

TITLE

DATE

DATE

SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory.
 - 2. Emergency manuals.
 - 3. Operation manuals for systems, subsystems, and equipment.
 - 4. Product maintenance manuals.
 - 5. Systems and equipment maintenance manuals.
- B. Related Requirements:
 - 1. Section 013300 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
 - 2. Section 019000 "General Commissioning Requirements" for verification and compilation of data into operation and maintenance manuals.

1.3 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

- A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Owner will comment on whether content of operations and maintenance submittals are acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operations and maintenance manuals in the following format:
 - 1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Owner.
 - a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
 - b. Enable inserted reviewer comments on draft submittals.
 - 2. One paper copy to Owner. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves.
- C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Owner will comment on whether general scope and content of manual are acceptable.
- D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect and Commissioning Authority will return copy with comments.
 - 1. Correct or revise each manual to comply with comments. Submit copies of each corrected manual within 15 days of receipt of comments and prior to commencing demonstration and training.

PART 2 PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

- A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:
 - 1. List of documents.
 - 2. List of systems.
 - 3. List of equipment.
 - 4. Table of contents.
- B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
- C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
- D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
 - 1. Title page.
 - 2. Table of contents.
 - 3. Manual contents.
- B. Title Page: Include the following information:
 - 1. Subject matter included in manual.
 - 2. Name and address of Project.
 - 3. Name and address of Owner.
 - 4. Date of submittal.
 - 5. Name and contact information for Contractor.
 - 6. Name and contact information for Construction Manager.
 - 7. Name and contact information for Architect.
 - 8. Name and contact information for Commissioning Authority.
 - 9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
 - 10. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
 - 1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

- E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
 - 1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
 - 2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
- F. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.
 - 1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
 - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.
 - 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
 - 3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
 - 4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
 - 5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 EMERGENCY MANUALS

- A. Content: Organize manual into a separate section for each of the following:
 - 1. Type of emergency.
 - 2. Emergency instructions.
 - 3. Emergency procedures.
- B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
 - 1. Flood.
 - 2. Gas leak.
 - 3. Water leak.

4. Power failure.
 5. Water outage.
 6. System, subsystem, or equipment failure.
 7. Chemical release or spill.
 - C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
 - D. Emergency Procedures: Include the following, as applicable:
 1. Instructions on stopping.
 2. Shutdown instructions for each type of emergency.
 3. Operating instructions for conditions outside normal operating limits.
 4. Required sequences for electric or electronic systems.
 5. Special operating instructions and procedures.
- 2.4 OPERATION MANUALS
- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
 1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 2. Performance and design criteria if Contractor has delegated design responsibility.
 3. Operating standards.
 4. Operating procedures.
 5. Operating logs.
 6. Wiring diagrams.
 7. Control diagrams.
 8. Piped system diagrams.
 9. Precautions against improper use.
 10. License requirements including inspection and renewal dates.
 - B. Descriptions: Include the following:
 1. Product name and model number. Use designations for products indicated on Contract Documents.
 2. Manufacturer's name.
 3. Equipment identification with serial number of each component.
 4. Equipment function.
 5. Operating characteristics.
 6. Limiting conditions.
 7. Performance curves.
 8. Engineering data and tests.
 9. Complete nomenclature and number of replacement parts.
 - C. Operating Procedures: Include the following, as applicable:
 1. Startup procedures.
 2. Equipment or system break-in procedures.
 3. Routine and normal operating instructions.
 4. Regulation and control procedures.
 5. Instructions on stopping.
 6. Normal shutdown instructions.
 7. Seasonal and weekend operating instructions.
 8. Required sequences for electric or electronic systems.
 9. Special operating instructions and procedures.

10. Training procedures.
 - D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
 - E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.
- 2.5 PRODUCT MAINTENANCE MANUALS
- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
 - B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
 - C. Product Information: Include the following, as applicable:
 1. Product name and model number.
 2. Manufacturer's name.
 3. Color, pattern, and texture.
 4. Material and chemical composition.
 5. Reordering information for specially manufactured products.
 - D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
 1. Inspection procedures.
 2. Types of cleaning agents to be used and methods of cleaning.
 3. List of cleaning agents and methods of cleaning detrimental to product.
 4. Schedule for routine cleaning and maintenance.
 5. Repair instructions.
 - E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
 - F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 1. Include procedures to follow and required notifications for warranty claims.
- 2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS
- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
 - B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
 - C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
 1. Standard maintenance instructions and bulletins.
 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 3. Identification and nomenclature of parts and components.
 4. List of items recommended to be stocked as spare parts.

- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
 - 1. Test and inspection instructions.
 - 2. Troubleshooting guide.
 - 3. Precautions against improper maintenance.
 - 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - 5. Aligning, adjusting, and checking instructions.
 - 6. Demonstration and training video recording, if available.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
 - 1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 - 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

PART 3 EXECUTION

3.1 MANUAL PREPARATION

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.
- B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
 - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - 1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

- F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
 - 1. Do not use original project record documents as part of operation and maintenance manuals.
 - 2. Comply with requirements of newly prepared record Drawings in Section 017839 "Project Record Documents."
- G. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION

SECTION 01 78 36 – WARRANTIES AND BONDS

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Compile specified Warranties and Bonds.
- B. Compile specified Service and Maintenance Contracts.
- C. Review submittals to verify compliance with Contract Documents.

1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Make particular reference to the following:
 - 1. Bid Bond: See General and Supplemental Conditions.
 - 2. Performance Bond and Labor and Material Payment Bond: See General and Supplemental Conditions.
 - 3. Warranty of Work after Final Payment: See General and Supplemental Conditions, 01 33 13 – Certificate of Compliance and 01 78 23 – Operating and Maintenance Data.
 - 4. Section 01 77 00 - Contract Closeout
 - 5. Section 01 78 23 - Operation and Maintenance Data

1.3 SUMMARY

- A. Definition
 - 1. “Standard product warranties” are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.
 - 2. “Special warranties” are written warranties required by or incorporated in the contract documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.
- B. Types – Categories of warranties required for the Work include:
 - 1. Special project warranty issued by Contractor and, where required, countersigned by installer or other recognized entity involved in performance of the work.
 - 2. Specified product warranty issued by a manufacturer or fabricator for compliance with requirements in contract documents.
 - 3. Coincidental product warranty, available on a product incorporated into the work, by virtue of manufacturer’s publication of warranty without regard for application requirements (non-specified warranty).
 - 4. Refer to sections of Division 2 through 33 for requirements of specified warranties.

5. Disclaimers and Limitations - Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the work that incorporates the products nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

1.4 START OF WARRANTIES

- A. Warranties shall begin at the date of Final Completion of the Work, with the exception of warranties for the HVAC equipment which shall commence with the acceptance of the Commissioning Report by the Owner. Reference Section 00 72 00 – General Conditions of the Contract for Construction, Article 9, paragraphs 9.8.4 and 9.10.2.

1.5 SUBMITTAL REQUIREMENTS

- A. Assemble Warranties, Bonds, and Service and Maintenance Contracts, executed by each of the respective Manufacturer, Suppliers and Subcontractors.
- B. Contractor and each Subcontractor shall submit a completed Warranty Contact List as attached to this section or in a similar format.
- C. Format
 1. Bind each manual in a three-ring, heavy-duty, vinyl, hardboard cover binder.
 2. On cover, imprint title "Warranty Manual"; name of project, Owner, Architect; and date of substantial completion.
 3. On bound edge, imprint name of project and owner and date of substantial completion.
 4. Pages to be neat, clean sheets, 8-1/2 by 11-inch maximum size or accordion foldouts to same size.
 5. Items to be identified with tabbed dividers showing name and number of appropriate specification sections.
 6. Arrange dividers and items in order they occur in specifications.
- D. Information Required
 1. Table of contents identifying separate warranties by specification section number and name.
 2. Contractor's warranty of the work per contract documents.
 3. Warranties, certificates, and bonds for all portions of the work per specifications, Divisions 1 through 33.
 4. Certificate of occupancy obtained from appropriate building officials.
- E. Provide complete information for each item:
 1. Product or Work Item.
 2. Firm, with name of principal, address, and telephone number.

3. Beginning date of Warranty, Bond, or Service and Maintenance Contract.
 4. Duration of Warranty, Bond, or Service and Maintenance Contract.
 5. Provide the following information for Owner's Personnel:
 - a. Procedure in case of failure or malfunction.
 - b. Instances which affect Warranty or Bond validity.
 6. Contractor, name of responsible principal, address, and telephone number.
- F. Distribution
1. Submit one preliminary copy to Architect for approval prior to final submittal.
 2. After approval of preliminary copy and within ten (10) days following Substantial Completion, prepare and submit three final copies to Architect – one for Architect and two for Owner.

1.6 WARRANTY OBLIGATIONS

- A. Following completion of field testing and before building and/or phase commissioning, the Contractor will be responsible for required interim maintenance. A record of the interim maintenance will be kept and made available to the Owner upon final completion of the project.
- B. Conducting of tests and inspections, review of specifications or plans, payment for goods and services, or acceptance by the Owner does not constitute a waiver, modification, or exclusion of any express or implied warranty or any right under the contract or in law.
- C. If the Contractor elects to store equipment or any subcomponent thereof on the project site or in an offsite storage facility, such storage shall be in accordance with the vendor's recommendations. All precautions to protect the original vendor's warranty, including interim maintenance, shall be exercised by the Contractor at the Contractor's expense.

1.7 CORRECTIVE MEASURES

- A. When requested by Owner, correct or replace defective work, substandard work, and non-conforming work not complying with specified requirements.
- B. Make corrections conforming to provisions of Contract Documents, governing authorities, specified Reference Standards, and manufacturer's instructions. Where in conflict, comply with conditions that are more stringent and verify with Architect.
- C. Coordinate corrective work to cause least interruption and disruption to Owner activities and occupation of site.
- D. Related Damages: Remove and replace work that has been damaged due to failure of Warranted Work, and Work that has been removed to gain access to Warranted Work.
- E. Reinstatement of Warranties: Reinstate warranties, beginning from completion date of restored or replaced items of Work, for time of original Warranty period.

- F. Assume full adjustment costs to meet Warranty provisions without regard as to whether or not Owner has benefited from a portion of Warranty period. Do not prorate.
- G. Owner may elect to correct defects, in event that Contractor fails to proceed with or comply with terms of Warranty within ten (10) working days after notice. Liability and expenses incurred shall be borne by Contractor and Contractor's Surety.
- H. Where delay may cause loss or damage, emergency repairs may be made by Owner without first giving notice to Contractor. Liability and expenses incurred shall be borne by Contractor or Contractor's Surety.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION 01 78 36

ATTACHMENTS

1. Warranty Contact List
2. Subcontractor's Warranty Contact List

WARRANTY CONTACT LIST

Date: _____ General Contract Date: _____

Owner: _____

Address: _____

Project: _____

The following subcontractors performed the work or furnished materials subject to warranty:

Warranted Work	Subcontractor and Address	Phone	Contact Person
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Contractor: _____

Address: _____

Phone: _____

Contact Person: _____

Signature: _____
(authorized representative)

END OF ATTACHMENT 1

SUBCONTRACTOR'S WARRANTY CONTACT LIST

Date: _____ General Contract Date: _____

Owner: _____

Address: _____

Project: _____

Trade: _____

Subcontractor: _____

Address: _____

Phone: _____

Contact Person: _____

Signature: _____

(authorized representative)

Contractor: _____

Address: _____

Phone: _____

Contact Person: _____

Signature: _____

(authorized representative)

END OF ATTACHMENT 2

SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
 - 4. Miscellaneous record submittals.
- B. Related Requirements:
 - 1. Section 017300 "Execution" for final property survey.
 - 2. Section 017700 "Closeout Procedures" for general closeout procedures.
 - 3. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit one set(s) of marked-up record prints.
 - 2. Number of Copies: Submit copies of record Drawings as follows:
 - a. Initial Submittal:
 - 1) Submit PDF electronic files of scanned record prints and one of file prints.
 - 2) Submit record digital data files and one set(s) of plots. DWG/CAD compatible.
 - 3) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
 - b. Final Submittal:
 - 1) Submit one paper-copy set of marked-up record prints.
 - 2) Submit PDF electronic files of scanned record prints and three set(s) of prints.
 - 3) Print each drawing, whether or not changes and additional information were recorded.
 - 4) Submit record digital data files and three set(s) of record digital data file plots. DWG/CAD Compatible.
- B. Record Specifications: Submit one paper copy and annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one paper copy, annotated PDF electronic files, and directories of each submittal.
 - 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.
- D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit one paper copy, annotated PDF electronic files, and directories of each submittal.
- E. Reports: Submit written report weekly indicating items incorporated into project record documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

PART 2 PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
 - 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding archive photographic documentation.
 - 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Depths of foundations below first floor.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Changes made by Change Order or Construction Change Directive.
 - k. Changes made following Architect's written orders.
 - l. Details not on the original Contract Drawings.
 - m. Field records for variable and concealed conditions.
 - n. Record information on the Work that is shown only schematically.
 - 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 - 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 - 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 - 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
 - 1. Format: Annotated PDF electronic file.
 - 2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
 - 3. Refer instances of uncertainty to Architect for resolution.
 - 4. Architect will furnish Contractor one set of digital data files of the Contract Drawings for use in recording information.

- a. See Section 013300 "Submittal Procedures" for requirements related to use of Architect's digital data files.
 - b. Architect will provide data file layer information. Record markups in separate layers.
 - C. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing record Drawings where Architect determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.
 1. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
 2. Consult Architect for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared record Drawings into record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.
 - D. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
 1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 2. Format: Annotated PDF electronic file.
 3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
 4. Identification: As follows:
 - a. Project name.
 - b. Designation "PROJECT RECORD DRAWINGS."
 - c. Name of Architect.
 - d. Name of Contractor.
- 2.2 RECORD SPECIFICATIONS
- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
 5. Note related Change Orders, record Product Data, and record Drawings where applicable.
 - B. Format: Submit record Specifications as annotated PDF electronic file.
- 2.3 RECORD PRODUCT DATA
- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 3. Note related Change Orders, record Specifications, and record Drawings where applicable.

- B. Format: Submit record Product Data as annotated PDF electronic file.
 - 1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as PDF electronic file.
 - 1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

PART 3 EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

END OF SECTION

SECTION 01 79 00 - DEMONSTRATION AND TRAINING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
 - 1. Demonstration of operation of systems, subsystems, and equipment.
 - 2. Training in operation and maintenance of systems, subsystems, and equipment.
 - 3. Demonstration and training video recordings.

1.3 INFORMATIONAL SUBMITTALS

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
 - 1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.
- B. Qualification Data: For facilitator.
- C. Attendance Record: For each training module, submit list of participants and length of instruction time.
- D. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

1.4 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 014000 "Quality Requirements," experienced in operation and maintenance procedures and training.
- C. Videographer Qualifications: A professional videographer who is experienced photographing demonstration and training events similar to those required.
- D. Preinstruction Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to demonstration and training including, but not limited to, the following:
 - 1. Inspect and discuss locations and other facilities required for instruction.
 - 2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
 - 3. Review required content of instruction.
 - 4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.5 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.

- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 PRODUCTS

2.1 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:
 - 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - a. System, subsystem, and equipment descriptions.
 - b. Performance and design criteria if Contractor is delegated design responsibility.
 - c. Operating standards.
 - d. Regulatory requirements.
 - e. Equipment function.
 - f. Operating characteristics.
 - g. Limiting conditions.
 - h. Performance curves.
 - 2. Documentation: Review the following items in detail:
 - a. Emergency manuals.
 - b. Operations manuals.
 - c. Maintenance manuals.
 - d. Project record documents.
 - e. Identification systems.
 - f. Warranties and bonds.
 - g. Maintenance service agreements and similar continuing commitments.
 - 3. Emergencies: Include the following, as applicable:
 - a. Instructions on meaning of warnings, trouble indications, and error messages.
 - b. Instructions on stopping.
 - c. Shutdown instructions for each type of emergency.
 - d. Operating instructions for conditions outside of normal operating limits.
 - e. Sequences for electric or electronic systems.
 - f. Special operating instructions and procedures.
 - 4. Operations: Include the following, as applicable:
 - a. Startup procedures.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.
 - e. Control sequences.
 - f. Safety procedures.
 - g. Instructions on stopping.
 - h. Normal shutdown instructions.
 - i. Operating procedures for emergencies.

- j. Operating procedures for system, subsystem, or equipment failure.
- k. Seasonal and weekend operating instructions.
- l. Required sequences for electric or electronic systems.
- m. Special operating instructions and procedures.
- 5. Adjustments: Include the following:
 - a. Alignments.
 - b. Checking adjustments.
 - c. Noise and vibration adjustments.
 - d. Economy and efficiency adjustments.
- 6. Troubleshooting: Include the following:
 - a. Diagnostic instructions.
 - b. Test and inspection procedures.
- 7. Maintenance: Include the following:
 - a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - c. List of cleaning agents and methods of cleaning detrimental to product.
 - d. Procedures for routine cleaning
 - e. Procedures for preventive maintenance.
 - f. Procedures for routine maintenance.
 - g. Instruction on use of special tools.
- 8. Repairs: Include the following:
 - a. Diagnosis instructions.
 - b. Repair instructions.
 - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - d. Instructions for identifying parts and components.
 - e. Review of spare parts needed for operation and maintenance.

PART 3 EXECUTION

3.1 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operation and Maintenance Data."
- B. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 - 1. Architect will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
 - 2. Owner will furnish an instructor to describe Owner's operational philosophy.
 - 3. Owner will furnish Contractor with names and positions of participants.
- C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
 - 1. Schedule training with Owner, through Architect, with at least seven days' advance notice.
- D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation

and maintenance data submittals.

- E. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

END OF SECTION

SECTION 01 91 13 - GENERAL COMMISSIONING

PART 1 - GENERAL

1.1 SUMMARY

- A. The Owner will employ an independent Commissioning Authority. The Commissioning Authority is an independent and knowledgeable third party, hired to verify that the systems work as intended. The Commissioning Authority will inform the Owner and the Architect of the results of commissioning and provide recommendations for final acceptance of commissioned systems.
- B. Commissioning is the process to verify to the Owner that mechanical and electrical systems, as well as other special systems, function together properly to meet the facility performance requirements and design intent as described in the Contract Documents. The Contractor shall be responsible for participation in the commissioning process as outlined below, and in references and attachments throughout the Contract Documents. The Contractor shall furnish labor and materials sufficient to meet all requirements of building commissioning under this contract.
- C. The Commissioning Authority, acting on the behalf of the Owner, will be cognizant of the fact that the Owner's Facilities Staff needs to be informed and given the opportunity to participate actively in the commissioning process to ensure a complete, thorough turnover of systems once the project is complete. To this end, the Commissioning Authority will ensure that Facilities Personnel are informed of commissioning activity and schedule, and of any coordination issues such as special testing procedures or opportunity for hands-on training during functional testing.
- D. The Commissioning Authority is not authorized to modify, add to, or revoke the requirements of the Contract Documents. A change in the work can only be made as provided in the General Conditions.
- E. Various sections in the Division(s) 21-25 – General Mechanical Provisions, Plumbing, Heating, Ventilating, and Air Conditioning (HVAC); and Division(s) 26-27 - Electrical specifications outline the specific commissioning responsibilities of each subcontractor for that division, and also obligate the Contractor to coordinate and manage the commissioning responsibilities of those subcontractors.

1.2 RELATED WORK

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to the work of this section.
- B. General requirements for testing agencies as specified in the Division 1.
- C. Applicable Divisions 21-25 sections identifying the requirements for plumbing and HVAC systems relating to the installation of mechanical equipment and systems, particularly with respect to equipment and system testing, start-up and performance demonstration/observation. Coordinate with the work of Divisions 26-27.
- D. Applicable Divisions 26-27 sections specifying the requirements for materials and installation of electrical equipment and systems, particularly with respect to equipment and system testing, start-up and performance demonstration/observation. Coordinate with the work of Divisions 21-25.

1.3 TERMS

- A. Acceptable Performance: A component or system being able to meet specified design parameters under actual load, including satisfactory documented completion of all functional performance tests, control system trending, and resolution of outstanding issues.
- B. Commissioning Authority: An independent and knowledgeable third party hired to verify that the systems achieve acceptable performance.

- C. Commissioning Team: The term used to define the overall group associated with performing commissioning work, including designated representatives of the Owner, Facilities Staff, Design Professionals, Construction Team, and the Commissioning Authority.
 - D. Construction Team: The term used to define the overall group responsible for performing the work to complete the work on the Contract Documents, including the Contractor, the Mechanical Contractor and associated subcontractors, the Electrical Contractor and associated subcontractors.
 - E. Design Intent: Documentation behind design decisions that were made to meet the Owner's project requirements. The design intent describes the systems, components, conditions and methods to provide a fully functioning building.
 - F. Functional Performance Testing: Full range of checks, tests and demonstrations carried out to determine that all components, sub-systems, systems and interfaces between the systems function in accordance with the Contract Documents. In this context, function includes all modes and sequences of control operation, all interlocks and conditional control responses, and all specified responses to abnormal emergency conditions.
- 1.4 OWNER PROJECT REQUIREMENTS (OPR): A DOCUMENT DEVELOPED BY THE OWNER WITH HELP OF THE COMMISSIONING AUTHORITY AND DESIGN TEAM. THE OPR DETAILS THE FUNCTIONAL REQUIREMENTS OF THE PROJECT AND THE EXPECTATIONS OF THE BUILDINGS USE AND OPERATION AS IT RELATES TO THE SYSTEMS BEING COMMISSIONED.
- 1.5 DUTIES OF CONTRACTOR
- A. Incorporate commissioning activities into the overall construction schedule.
 - B. Coordinate participation of the Final Cleaning, Mechanical, Electrical, Controls, Security, Fire Alarm and TAB Contractors in the commissioning process.
 - C. Collect and provide to the Commissioning Authority information requested for development of a complete commissioning plan, pre-functional test checklists, commissioning field notebook, and functional test procedures.
 - D. Review the Commissioning Plan, project communication reports and test results and submit comments to the Commissioning Authority.
 - E. Provide equipment submittals for systems to be commissioned to the Commissioning Authority.
 - F. Manage, track and complete the commissioning field notebook, including pre-functional test checklists and commissioning related specification requirements.
 - G. Verify that coordination, installation, quality control, and final testing have been completed such that installed systems and equipment comply with construction documents.
 - H. Provide Commissioning Authority with controls system wiring diagrams and narrative sequences of operation in time for use in preparing the functional test procedures.
 - I. Participate in any efforts to finalize sequences of operations with Owner, Architects, Engineers, Mechanical Contractor, Mechanical Subcontractors and Commissioning Authority.
 - J. In a timely manner, address issues identified during construction that may affect the commissioning process or final system performance.
 - K. Participate in commissioning meetings with the Commissioning Authority.
 - L. Provide preliminary TAB report, indicating all actual field values recorded, to the Commissioning Authority prior to initiation of functional testing. These reports shall be incorporated in the Commissioning Field Notebook.
 - M. Issue a written notice of readiness for each system to Commissioning Authority upon completion of all systems work, start-up and pre-functional test requirements by trade Contractors.

- N. Operate equipment and systems as required for functional performance testing. This includes, but is not limited to, manipulating the appropriate controls systems to achieve the expected response for the functional test procedure.
 - O. Participate in the fine-tuning or troubleshooting of system performance if either of these measures becomes necessary.
 - P. Submit complete operation and maintenance information and as-built drawings to the Commissioning Authority for review.
 - Q. Provide documentation of training for the systems specified.
 - R. Fire alarm contractor to demonstrate full function of system to Commissioning Authority prior to Fire Marshall testing.
 - S. The Controls, Fire Alarm, Security and Door Access subcontractors shall perform point-to-point testing of all control components as specified in the construction documents. The procedures and methods for this testing will be reviewed by the Commissioning Authority. The checkout may be witnessed by the Commissioning Authority or other appropriate parties.
- 1.6 DUTIES OF COMMISSIONING AUTHORITY
- A. Provide Contractor with expected durations of commissioning activities for inclusion in the construction schedule.
 - B. Collect and review design intent from the design team.
 - C. Review the Contract Documents.
 - D. Develop the commissioning plan.
 - E. Develop pre-functional test checklists for each piece of commissioned equipment.
 - F. Develop the Commissioning Field Notebook for use by the Contractor. Provide supplemental documentation as necessary to ensure that all aspects of start-up and testing have been complete and documented prior to functional testing.
 - G. Organize a commissioning kick-off meeting and present the commissioning plan to the Commissioning Team.
 - H. Review the Contractor submittals relative to the systems to be commissioned.
 - I. Perform construction installation inspections follow installation progress, and to verify system installation quality and readiness for testing.
 - J. Observe the start-up activities and initial testing of equipment and systems as required and review Contractor start-up documentation.
- 1.7 DEVELOP FUNCTIONAL TEST PROCEDURES FROM CONTRACTOR SUBMITTALS, INCLUDING DESIGNER-APPROVED CONTROL DOCUMENTATION, WITH NARRATIVE SEQUENCES OF OPERATION AND CONTROL DIAGRAMS.
- A. Direct and perform functional test with assistance from Contractor.
 - B. Provide site observation, functional test and other project reports in a timely manner. Document inconsistencies or deficiencies in system operations and system compliance.
 - C. Coordinate via the Architect participation of Owner's personnel involved with equipment, component and systems performance verification, and participation in required training.
- 1.8 WITNESS AND VERIFY SATISFACTORY COMPLETION OF EQUIPMENT AND COMPONENT TESTS AND SYSTEMS AND INTER-SYSTEMS FUNCTIONAL PERFORMANCE TESTS.
- A. Maintain the commissioning deficiency log. Verify resolution of deficiencies identified through the commissioning process.
 - B. Analyze and compile trend log results from performance period activities.
 - C. Verify training for commissioned equipment and systems is provided to the Owner.
 - D. Review Contractor Operations & Maintenance Manuals for commissioned equipment and systems.
 - E. Complete a commissioning report.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 COMMISSIONING PROCESS

A. Commissioning Schedule

1. Contractor to incorporate commissioning activities into the overall construction schedule. If construction is phased, commissioning activities are to be included in all phases of the schedule. The schedule defines the milestones and conditions that must be achieved before functional testing can commence. The schedule also includes the expected duration of the various tasks. The Commissioning Authority will provide the Contractor with expected durations of commissioning activities.
2. Commissioning activities to be included in the overall construction schedule include, but are not limited to:
 - a. Power to equipment complete
 - b. Mechanical equipment start-up
 - c. Pre-functional test endorsement
 - d. Controls system checkout completion
 - e. Controls system fully operational
 - f. Testing, adjusting, and balancing
 - g. Functional performance testing
 - h. Performance period
 - i. Operations & maintenance manual review
 - j. Owner personnel training

3.2 CONTRACT DOCUMENT REVIEW

1. The Commissioning Authority will collect and review design intent information from the designers and verify that it meets the Owner's project requirements. Design intent documentation will be used in conjunction with the Contract Documents to develop the commissioning plan, pre-functional tests, and functional performance tests.
- B. Commissioning Plan**
1. The Commissioning Authority will develop a commissioning plan for the project. The commissioning plan is a tool through which the commissioning process is described and incorporates the Owner, Designers, Contractor and Commissioning Authority's rolls relative to the commissioning process. The commissioning plan will include the following:
 - a. Purpose of commissioning
 - b. Detail the commissioning process
 - c. Identify commissioning team members
 - d. Include a commissioning team organization chart
 - e. Define commissioning team member responsibilities
 - f. Describe pre-functional and functional test procedures
 - g. Outline systems to be commissioned
 - h. Provide the commissioning schedule
- C. Pre-functional Test Checklists**
1. The Commissioning Authority will develop pre-functional test checklists for each piece of commissioned equipment. The pre-functional test checklist will outline required steps for the contractor to complete prior to functional testing. Pre-functional test checklists verify installation, start-up and operational assessments have been completed for the equipment..
 2. Manufacturer start-up forms provided with pieces of equipment will be collected in addition to the pre-functional test checklists.

- D. Commissioning Field Notebook
 1. The Commissioning Authority will develop a Commissioning Field Notebook to be used and completed by the Contractor. The notebook will identify and track all pertinent commissioning documentation required during the installation, start-up, and checkout phases. The notebook will be maintained by the Contractor on site and will be made available to all subcontractors for their use. The notebook provides a central location for the Subcontractors and Commissioning Authority to identify, copy, and organize all pertinent commissioning information.
 2. The Commissioning Field Notebook will contain:
 - a. Summary describing notebook contents and use.
 - b. Commissioning plan for Contractor field reference.
 - c. Tabs for each system with copies of pre-functional and functional test check sheets for pieces of equipment identified as part of that system.
 - d. Commissioning project communication reports, deficiency logs schedule information or any other documentation provided by the Commissioning Authority.
- E. Commissioning Kickoff Meeting
 1. The commissioning plan will be presented to the Commissioning Team during a commissioning kick-off meeting. The Commissioning Team will review the plan and provide comments to the Commissioning Authority. The Commissioning Authority will incorporate appropriate comments into the plan and a finalized commissioning plan will be distributed to the Commissioning Team.
 2. The Commissioning Field Notebook will be presented to the Contractor during the commissioning kick-off meeting. Instruction for its use will be conveyed during the meeting.
- F. Installation Inspections
 1. During the course of construction, the Commissioning Authority will perform installation inspections for commissioned equipment and systems. Deficiencies will be noted and conveyed in project communication reports to the appropriate commissioning team members.
- G. Pre-functional Test Checklist Completion
 1. Using the pre-functional test checklists developed by the Commissioning Authority, the Contractor will verify that the systems they install are in compliance with the construction documents and are fully functional. Functional testing will only begin when checklists are completed by the appropriate subcontractors, initialed, signed, and returned to the Commissioning Authority indicating specific system completion.
 2. Contractor will issue a written notice of readiness to the Commissioning Authority upon completion of all systems work, start-up and endorsement of pre-functional tests.
- H. Contractor Submittal Review
 1. In preparation for development of functional test procedures, the Commissioning Authority will review Contractor submittals for commissioned equipment and systems.
 2. The Contractor will provide copies of the submittals for commissioned systems and equipment to the Commissioning Authority for use in development of functional test procedures. Submittals will be reviewed for conformity with the design intent.
- I. Functional Test Procedures
 1. The Commissioning Authority will develop functional test procedures for each piece of commissioned equipment. The functional tests outline the process for testing the building's systems. Functional tests verify the performance of equipment adhere to the design intent.

2. Functional test procedures include, but are not limited to, the following:
 - a. Verification of testing, adjusting and balancing performance.
 - b. Verification of the performance of automatic controls in all seasonal modes.
 - c. Verification of the performance of a HVAC system.
 - d. Verification of the performance of electrical systems.
 - e. Verification of the performance of plumbing systems.
 - f. Verification of the performance of all life safety devices and systems as they interface with the HVAC systems.
 - g. Verification of the response of automated controls to alarms, fire alarm input, and power failures.
 - h. Verification of all security systems components and response.
 - 1) The Security and Door Access functional performance test documentation shall be provided by the appropriate subcontractor. Test shall cover all sequences and components of the systems. Once systems have been complete and tested by subcontractor, Commissioning Authority will verify correct operation.
 - i. Verification of trending capabilities of the automated controls system.

3.3 FUNCTIONAL TESTING

1. Functional testing is intended to begin upon completion of a system. The Commissioning Authority will not begin the functional testing process until each system is complete and documented. Testing may proceed prior to the completion of systems and/or sub-systems if expediting this work is in the best interests of the Owner.
 2. Functional testing is performed by the Contractor and witnessed by the Commissioning Authority to verify proper sequencing, operation and performance of installed equipment and systems under realistic operating conditions. As tests are successfully completed, systems will be deemed acceptable by the Commissioning Authority.
 3. The Contractor is responsible for coordinating participation of Commissioning Authority and Subcontractors in functional testing.
 4. For security, fire alarm, theater sound and theater lighting systems, the installing contractor will be responsible for providing point-to-point documentation and functional test documentation. The Commissioning Authority will witness testing of these systems.
- B. Commissioning Deficiency Log
1. When acceptable performance cannot be achieved by tested equipment and systems, the cause of the deficiency will be identified. Deficiencies will be collected and tracked in a commissioning deficiency log maintained by the Commissioning Authority.
- C. Corrective Measures
1. If acceptable performance cannot be achieved by a piece of equipment or a system, and if the deficiency is caused by installation error by the Contractor, the necessary corrective measures shall be carried out by the Contractor. Once corrective measures have been completed, the equipment or system will be retested by the Commissioning Authority until acceptable performance is achieved.
 2. The Contractor will be allowed one retest by the Commissioning Authority after initial testing of the equipment. If acceptable performance is not achieved after the initial retest, the Contractor shall be financially responsible at standard rates to reimburse the Owner's Representatives for the additional time taken to resolve the deficiency.
- D. Project Communication Reports
1. In addition to the pre-functional test checklists, functional test procedures, and the commissioning deficiency log, project communication reports will be delivered for all other commissioning activities performed by the Commissioning Authority. Project

communication reports will be issued to the Contractor and key members of the Commissioning Team to document apparent deficiencies identified during examination of design and construction documents; daily activities on-site; installation deficiencies; and successful or unsuccessful functional testing results.

E. Commissioning Meetings

1. Commissioning meetings will be held periodically during the construction process to review the status of the construction and commissioning work, develop construction completion and testing schedules, and the status of submittals required by this section. Attendance by the Construction Team is required for commissioning meetings.
2. Commissioning meetings will be coordinated by the Contractor. Meeting minutes will be developed and maintained by the Commissioning Authority.

F. Performance Period

1. Upon successful completion of functional test procedures, a performance period of 15 consecutive calendar days shall commence on first day following the last performance test. This period shall be completed prior to final acceptance of the project. In event of failure to meet standard of performance during any initiated performance period, it is not required that one 15-calendar day period expire in order for another performance period to begin.

G. If equipment or system operate and demonstrate continuing compliance with specified requirements for period of 15 consecutive calendar days from commencement date of performance period, it shall be deemed to have met the standard of performance.

1. Equipment will not be accepted by the Owner and final payment will not be made by the Owner until acceptable performance is met.
2. Contractor shall provide Commissioning Authority with trend logs of the system performance for the control variables and set point in each control process in 15-minute time increments.
3. Systems shall be first tested as independent building systems followed by tests of systems tied into Owner's systems. Types of Owner's systems include, but are not limited to, central plant heating and cooling; off-site security / alarm monitoring; and campus automated controls systems.
4. Upon Contractor's completion of the requirements of the commissioning plan and the successful completion of the performance period, and receipt of the required documentation, the Commissioning Authority shall provide the Owner with a statement of acceptable performance.

H. Operations & Maintenance Manual Review

1. The Contractor shall assemble Operations & Maintenance Manuals as described in other sections of these Contract Documents.
2. The Commissioning Authority will review the Operations & Maintenance Manuals of commissioned systems and equipment once they have been reviewed and accepted by the Designer.

I. Training

1. A training plan will be developed by the Contractor outlining equipment that requires training, who will perform the training, when the training will occur, and the required duration of the training. Once the training plan is developed, the Owner will provide that the appropriate personnel attend the training.
2. Training sessions should include using the Operations & Maintenance Manuals and as-built drawings assembled by the Contractor.

3. Detailed requirements for training and instruction are contained in other sections of these Contract Documents. The Commissioning Authority will track that training requirements have been satisfied by the Contractor.
- J. Commissioning Report
1. Once acceptable performance is achieved, the Commissioning Authority will complete a commissioning report. The report shall include:
 - a. A commissioning activity executive summary
 - b. The finalized commissioning plan
 - c. The completed Commissioning Field Notebook, including pre-functional test checklists and specified commissioning related documentation
 - d. Completed functional test procedures
 2. Commissioning project communication reports
 - a. Up-to-date commissioning deficiency log
 - b. Performance period trend log analyses
- 3.4 SYSTEMS TO BE COMMISSIONED
- A. Systems and equipment to be functionally tested include, but are not limited to:
1. Air-handling systems, including packaged air handling units, terminal units, fans, coils, dampers, valves, motor controllers, fire alarm interface devices, and automated control components.
 2. Auxiliary heating and cooling equipment, including air conditioning/condensing units, unit heaters, radiant heaters, fire alarm interface devices, and automated control components.
 3. Heating water system, including, boilers, boiler controllers, steam, steam condensate, pumps, control valves, motor controllers, air separators, expansion tanks, chemical treatment, make-up water, fire alarm interface, and automated control components.
 4. Domestic water systems, including domestic water heaters and associated pumps, expansion tanks, and automated control components.
 5. Automated control system, including equipment operational sequences; point-to-point checkout, control component calibration, graphics, alarming, fire alarm interface, and trending.
 6. Lighting system controls, including switches, photocells, occupancy sensors, timers, and other devices affecting lighting system operation.
 7. Fire Alarm System components prior to Fire Marshal testing.

END OF SECTION

SECTION 02 41 19 - SELECTIVE DEMOLITION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Selective demolition of building elements.
- B. Utility Services and Mechanical/Electrical System.
- C. Salvage and removal of building elements.

1.2 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week before starting work of this section in accordance with Section 01 30 00 - Administrative Requirements.
 - 1. Review preparation and installation procedures and coordinating and scheduling required with related work.
 - 2. Review Owner salvage requirements and conduct a walk-through with Owner present.

1.3 SUBMITTALS

- A. Qualification Data: For demolition contractor listing projects and references.
- B. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
 - 1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of partitions, barricades and fences.
 - 2. Include procedures and coordination with other work in progress, a disconnection schedule of utility services, and a detailed description of methods and equipment to be used for each operation and of the sequence of operations.
 - 3. Identify demolition firm and submit qualifications.
 - 4. Include a summary of safety procedures.
- C. Engineering Survey.
- D. Existing Condition Survey.
- E. Shop Drawings: extents of demolition, locations of existing utilities, and locations of utility capping. Indicate structural members and elements that will be demolished. .
- F. Closeout Submittals: Accurately record actual locations of capped and active utilities and subsurface construction.

1.4 QUALITY ASSURANCE

- A. Demolition Contractor Qualifications: Company specializing in selective demolition comparable in scope, environmental and historical sensitivity of work specified in this section with minimum 5 years' experience.

PART 2 PRODUCTS

2.1 DESCRIPTION

- A. Demolition of existing elements to accommodate tie-in of new work to existing conditions.

2.2 PERFORMANCE AND DESIGN CRITERIA

- A. 29 CFR 1910: Occupational Safety and Health Standards.
- B. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.
- C. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.
- D. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- E. Storage or sale of removed items or materials on-site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
- G. Comply with governing EPA notification regulations before beginning selective demolition.
- H. Comply with hauling and disposal regulations of authorities having jurisdiction.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before start of work.
- B. Review record documents provided by Owner and schedule listing salvage and remove for reuse items.
- C. Engage a professional engineer to perform an engineering survey to determine if removing indicated elements may result in a structural deficiency or unsafe condition during scope of work.
- D. Perform a survey of existing conditions by use of measured drawings and preconstruction photographs.
- E. It is not expected that hazardous materials will be encountered in the Work.
 - 1. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

3.2 PREPARATION

- A. Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
- B. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
- C. Provide fire watch during hot work while sprinklers are offline.

3.3 SELECTIVE DEMOLITION OF BUILDING ELEMENTS

- A. Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations.
- B. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction.
- C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and reinstalled in their original locations after selective demolition operations are complete.
- D. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

3.4 SALVAGE AND REMOVAL OF BUILDING ELEMENTS

- A. Removed and Salvaged Items:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until delivery to Owner.
 - 4. Transport items to Owner's storage area designated by Owner.
 - 5. Protect items from damage during transport and storage.
- B. Removed and Reinstalled Items:
 - 1. Clean and repair items to functional condition adequate for intended reuse.
 - 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 - 3. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- C. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before

starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.

- D. Maintain fire watch during and for at least two hours after flame-cutting operations.
- E. Dispose of demolished items and materials promptly.

3.5 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition. Return adjacent areas to condition existing before selective demolition rations began.
- B. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- C. Dispose of all waste material in accordance with project's Waste Management Plan.

3.6 PROTECTION

- A. Remove temporary barricades and protections where hazards no longer exist.

3.7 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Arrange to shut off utilities with utility companies.
 - 2. If services/systems are required to be removed, relocated or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 3. Disconnect, demolish, and remove the fire suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Equipment to be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.

3.8 SCHEDULE

- A. Locations and extent in accordance with demolition drawings.
- B. Salvaged Items:
 - 1. _____

END OF SECTION

SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Formwork.
- B. Reinforcement.
- C. Concrete materials.
- D. Mixture design.
- E. Placement procedures.
- F. Finishes.

1.2 RELATED REQUIREMENTS

- A. 03 30 03 - Underslab Vapor Retarder: For vapor retarder and accessories.
- B. 05 12 00 - Structural Steel Framing: For embedded steel posts and connections.
- C. 07 90 05 - Joint Sealers: Products and installation for sealants and joint fillers for saw cut joints.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.
- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
 - 1. Indicate amounts of mixing water to be withheld for later addition at Project site.
- C. Steel Reinforcement Shop Drawings: Placing Drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.
- D. Construction Joint Layout: Indicate proposed construction joints required to construct the structure, subject to approval by the Architect.
- E. Qualification Data: For Installer, manufacturer, and testing agency.
- F. Welding Certificates: Copies of certificates for welding procedures and personnel.
- G. Test Reports: Submit report for each test or series of tests specified.
- H. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer, detailing fabrication, assembly, and support of formwork.
 - 1. Shoring and Reshoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and reshoring installation and removal.
- I. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.
- J. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.
- K. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
 - C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C1077 and ASTM E329 for testing indicated.
 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
 2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician, Grade II.
 - D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D1.4M.
- 1.5 FIELD CONDITIONS
- A. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301 (ACI 301M).
 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
 - B. Hot-Weather Placement: Comply with ACI 301 (ACI 301M) and ACI 305.1 (ACI 305.1M), and as follows:
 1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

PART 2 PRODUCTS

2.1 FORMWORK

- A. Formwork Design and Construction: Comply with guidelines of ACI 347R to provide formwork that will produce concrete complying with tolerances of ACI 117.
- B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess or permitted tolerances.
 1. Form Facing for Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.
 2. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.
 3. Form Ties: cone snap; taper removable bolt type that will leave no metal within 1-1/2 inches of concrete surface.
 4. Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
 5. Form Coating: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

6. Formulate form-release agent with rust inhibitor for steel form-facing materials.

2.2 REINFORCEMENT MATERIALS

- A. Reinforcing Steel: Per Structural drawings.
- B. Steel Welded Wire Reinforcement (WWR): Plain type, ASTM A1064/A1064M.
 1. Form: Flat Sheets.
 2. WWR Style: As indicated on drawings.
- C. Reinforcement Accessories:
 1. Tie Wire: Annealed, minimum 16 gauge, 0.0508 inch.
 2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.
 3. Provide stainless steel, galvanized, or plastic components for placement within 1-1/2 inches of weathering surfaces.
- D. CONCRETE MATERIALS
 1. Cement: Per Structural drawings.
 - a. Acquire cement for entire project from same source.
 2. Fine and Coarse Aggregates: Per Structural drawings.
 - a. Acquire aggregates for entire project from same source.
 3. Fly Ash: ASTM C618, Class C or F.
 4. Water: Per Structural drawings.
- E. ADMIXTURES
 1. Chemical Admixture: Shall be compatible with other admixtures and cementitious materials. Do not use admixtures containing calcium chloride.
 2. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.
 3. Air Entrainment Admixture: ASTM C260/C260M.
 4. High Range Water Reducing and Retarding Admixture: ASTM C494/C494M Type G.
 5. High Range Water Reducing Admixture: ASTM C494/C494M Type F.
 6. Water Reducing Admixture: ASTM C494/C494M Type A.
 7. Shrinkage Reducing Admixture:
 - a. ASTM C494/C494M, Type S.
- F. ACCESSORY MATERIALS
 1. Non-Shrink Cementitious Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
 - a. Grout: Per Structural drawings.
 - b. Minimum Compressive Strength at 48 Hours, ASTM C109/C109M: 2,000 pounds per square inch.
 - c. Products containing aluminum powder are not permitted.
- G. BONDING AND JOINTING PRODUCTS
 1. Epoxy Bonding System:
 - a. Complying with ASTM C881/C881M and of Type required for specific application. See Drawings for additional requirements.
 2. Slab Isolation Joint Filler: 1/2 inch thick, height equal to slab thickness, with removable top section that will form 1/2 inch deep sealant pocket after removal.
 3. Slab Construction Joint Devices: Combination keyed joint form and screed, galvanized steel, with rectangular or round knockout holes for conduit or rebar to pass through joint form at 6 inches on center; ribbed steel stakes for setting.
- H. CURING MATERIALS

1. Evaporation Reducer: Liquid thin-film-forming compound that reduces rapid moisture loss caused by high temperature, low humidity, and high winds; intended for application immediately after concrete placement.
 2. Curing Compound, Naturally Dissipating: Clear, water-based, liquid membrane-forming compound; complying with ASTM C309.
- I. CONCRETE MIX DESIGN
1. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations. Prepare design mixes for each type and strength of concrete determined by either laboratory trial mix or field test data bases. Use a qualified independent testing agency for preparing and reporting proposed mix designs for the laboratory trial mix basis.
 2. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.
 3. Normal Weight Concrete:
 - a. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: As indicated on drawings.
 - b. Fly Ash Content: Maximum 25 percent of cementitious materials by weight.
 - c. Water-Cement Ratio: As indicated on Drawings.
 - d. Total Air Content: Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content as follows within a tolerance of plus 1 or minus 1.5 percent, unless otherwise indicated and as determined in accordance with ASTM C173/C173M. See drawings for additional requirements.
 - e. Maximum Aggregate Size: 1 inch.
- J. MIXING
1. Adding Water: If concrete arrives on-site with slump less than suitable for placement, do not add water that exceeds the maximum water-cement ratio or exceeds the maximum permissible slump.
- 2.3
- 2.4 EXAMINATION
- A. Verify lines, levels, and dimensions before proceeding with work of this section.
- 2.5 PREPARATION
- A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.
 - B. Verify that forms are clean and free of rust before applying release agent.
 - C. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.
 - D. Prepare existing concrete surfaces to be repaired according to ICRI 310.2R.
 - E. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent in according to bonding agent manufacturer's instructions.
 - F. Link locations where new concrete is doveled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.
 - G. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Comply with ASTM E1643. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.
 1. Vapor Retarder Over Granular Fill: Install compactible granular fill before placing vapor retarder as indicated on drawings. Do not use sand.

2.6 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS

- A. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.
- B. Install welded wire reinforcement in maximum possible lengths, and offset end laps in both directions. Splice laps with tie wire.
- C. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with concrete placement.

2.7 PLACING CONCRETE

- A. Place concrete in accordance with ACI 304R.
- B. Place concrete for floor slabs in accordance with ACI 302.1R.
- C. Notify Architect not less than 48 hours prior to commencement of placement operations.
- D. Test Samples taken.
- E. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.
- F. Place concrete continuously without construction (cold) joints wherever possible; where construction joints are necessary, before next placement prepare joint surface by removing laitance and exposing the sand and sound surface mortar, by sandblasting or high-pressure water jetting.
- G. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

2.8 SLAB JOINTING

- A. Anchor joint fillers and devices to prevent movement during concrete placement.
- B. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.
 - 1. Install wherever necessary to separate slab from other building members, including columns, walls, equipment foundations, footings, stairs, manholes, sumps, and drains.
- C. Saw Cut Contraction Joints: Saw cut joints before concrete begins to cool, within 4 to 12 hours after placing; use 3/16 inch thick blade and cut at least 1 inch deep but not less than one quarter (1/4) the depth of the slab.
- D. Construction Joints: Where not otherwise indicated, use metal combination screed and key form, with removable top section for joint sealant.

2.9 FLOOR FLATNESS AND LEVELNESS TOLERANCES

- A. Minimum F(F) Floor Flatness and F(L) Floor Levelness Values:
 - 1. Exposed to View and Foot Traffic: F(F) of 20; F(L) of 15.
 - 2. Under Thick-Bed Tile: F(F) of 20; F(L) of 15.
 - 3. Under Carpeting: F(F) of 25; F(L) of 20.
 - 4. Under Thin Resilient Flooring and Thinset Tile: F(F) of 35; F(L) of 25.
- B. Measure F(F) Floor Flatness and F(L) Floor Levelness in accordance with ASTM E1155 (ASTM E1155M), within 48 hours after slab installation; report both composite overall values and local values for each measured section.
- C. Correct the slab surface if composite overall value is less than specified and if local value is less than two-thirds of specified value or less than F(F) 13/F(L) 10.
- D. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

2.10 CONCRETE FINISHING

- A. Repair surface defects, including tie holes, immediately after removing formwork.
- B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.

- C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
 - 1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.
- D. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
 - 1. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI 302.1R; thin floor coverings include carpeting, resilient flooring, seamless flooring, thin set quarry tile, and thin set ceramic tile.
 - 2. Decorative Exposed Surfaces: Trowel as described in ACI 302.1R; take measures necessary to avoid black-burnish marks; decorative exposed surfaces include surfaces to be stained or dyed, surfaces to receive liquid hardeners, surfaces to be polished, and all other exposed slab surfaces.
 - 3. Other Surfaces to Be Left Exposed: Trowel as described in ACI 302.1R, minimizing burnish marks and other appearance defects.
- E. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains as indicated on drawings.

2.11 CURING AND PROTECTION

- A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
 - 1. Normal concrete: Not less than seven days.
- C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.
- D. Surfaces Not in Contact with Forms:
 - 1. Slabs and Floors To Receive Adhesive-Applied Flooring: Curing compounds and other surface coatings are usually considered unacceptable by flooring and adhesive manufacturers. If such materials must be used, either obtain the approval of the flooring and adhesive manufacturers prior to use or remove the surface coating after curing to flooring manufacturer's satisfaction.
 - 2. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
 - a. Ponding: Maintain 100 percent coverage of water over floor slab areas, continuously for 4 days.
 - b. Spraying: Spray water over floor slab areas and maintain wet.
 - c. Saturated Burlap: Saturate burlap-polyethylene and place burlap-side down over floor slab areas, lapping ends and sides; maintain in place.
 - 3. Final Curing: Begin after initial curing but before surface is dry.
 - a. Moisture-Retaining Sheet: Lap strips not less than 3 inches and seal with waterproof tape or adhesive; secure at edges.
 - b. Curing Compound: Apply in two coats at right angles, using application rate recommended by manufacturer.

2.12 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.
- B. Provide free access to concrete operations at project site and cooperate with appointed firm.
- C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.

- D. Tests of concrete and concrete materials may be performed at any time to ensure compliance with specified requirements.
- E. Compressive Strength Tests: ASTM C39/C39M, for each test, mold and cure four concrete test cylinders. Test three cylinders in accordance with ASTM C39/39M and hold one test cylinder in reserve. Obtain test samples for every 100 cubic yards or less of each class of concrete placed.
- F. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
- G. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.

2.13 DEFECTIVE CONCRETE

- A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.
- B. Defective Concrete: Concrete not complying with required lines, details, dimensions, tolerances or specified requirements.
- C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.
- D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

2.14 PROTECTION

- A. Do not permit traffic over unprotected concrete floor surface until fully cured.

END OF SECTION

SECTION 03 30 03 - UNDERSLAB VAPOR RETARDER

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Under slab vapor retardant sheeting at interior slabs on grade.

1.2 RELATED REQUIREMENTS

- A. Divisions 20 and 30 Facility Services Subgroup: Plumbing and electrical penetrations.
- B. Division 30 Sections on Earthwork, Excavation and Backfill.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate penetrations through vapor retarder.
- B. Select screeds and other concrete work accessories to ensure no penetration of the vapor retarder during concrete work.

1.4 SUBMITTALS

- A. Product Data: Published descriptive literature for vapor retarder and patching materials.
- B. Shop Drawings: Indicate extents, special joint or termination conditions, and conditions of interface with other materials.
- C. Manufacturer Instructions: Installation instructions, special procedures, and perimeter, penetration and other conditions requiring special attention. Include limitations.
- D. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.5 MOCKUP

- A. Construct mockup of 100 sq ft of waterproofing, representing finished work including internal and external corners, sealing, counterflashings, control and expansion joints, drainage panel, and protection board.
- B. Locate where directed.
- C. Mockup may remain as part of the Work.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Take precautions to prevent puncturing and tearing vapor retarder.

PART 2 PRODUCTS

2.1 DESCRIPTION

- A. Underslab membrane vapor retarder.

2.2 PERFORMANCE AND DESIGN CRITERIA

- A. Thickness: 15 mil minimum.
- B. ASTM E1745, Class A, sheet vapor retarder.
- C. Moisture Vapor Permeance: 0.01 perms when tested to ASTM E154/E154M, after mandatory conditioning tests per sections 8,11,12, and 13.
- D. Puncture Resistance: 140 lbf when tested in accordance with ASTM E154/E154M.
- E. Tensile Strength: 45 foot-pounds per inch, tested to ASTM E154/E154M, Section 9, Method ASTM D882.
- F. Initial Tear Resistance: Minimum 8.0 pounds force in machine direction and transverse direction, tested to ASTM D1004.
- G. Low Temperature Impact: Pass at minus 15 degrees F; ASTM D146/D146M.

2.3 MANUFACTURERS

- A. Specification is based on Basis of Design products.
 - 1. The Henry Company; www.henry.com
 - 2. Stego Industries LLC; Stego Wrap; www.stegoindustries.com.
 - 3. W.R. Meadows Sealtight; Perminator; www.wrmeadows.com.

2.4 MATERIALS

- A. Underslab Vapor Retarder:
 - 1. Basis of Design:
 - a. Moistop Ultra 15 by The Henry Company.
 - b. Stego Wrap Vapor Barrier 15 mil by Stego Industries LLC.
 - c. Perminator by W.R. Meadows Sealtight.

2.5 ACCESSORIES

- A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify installation conditions as satisfactory to receive work of this Section before beginning.
- B. Verify subgrade free from conditions that may cause puncture or other damage to vapor retarder.

3.2 PREPARATION

- A. Complete substrate work before beginning work of this Section.
 - 1. Compacted Structural Fill per structural notes and Division 31. Level, tamp, or roll as necessary for smooth level surface prior to installation of vapor retarder.
 - 2. Through-Slab Penetrations: Ensure that drain lines, electrical conduit and other utilities of Division 20 thru Division 30 are in place and firmly anchored.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions and ASTM E1643.
- B. Interior Concrete Slabs-On Grade: Provide vapor retarder where indicated on drawings.
- C. Install vapor retarder sheet over compacted base.
- D. Roll down vapor retarder in widest practical width, parallel with direction of concrete pour, and with minimum number of joints.
- E. Lap vapor retarder over footings and seal with pressure sensitive tape to foundation wall.
- F. Overlap joints 6 inches minimum and seal with pressure sensitive tape.
- G. Promptly patch tears and punctures as they occur.
- H. Repair damaged areas by cutting vapor retarder as patches. Overlap tears and holes 6 inches beyond damaged area with patches. Seal patch to installed vapor retarder with pressure sensitive tape or as instructed by manufacturer.
- I. Seal pipe penetrations and other openings through concrete slab with vapor retarder or factory fabricated boots and pressure sensitive tape. Field fabricate boots and other shapes as necessary to seal vapor retarder against vapor penetration.
- J. Place concrete slab-on-grade directly over installed vapor retarder under work of Section 03 30 00 - Cast-in-Place Concrete.
- K. Do not install sand layer or any other material over vapor retarder prior to placement of concrete slab-on-grade.

3.4 FIELD QUALITY CONTROL

- A. Verify vapor retarder installed in accordance with manufacturer's instructions with permanent penetrations taped and sealed.
- B. Verify that vapor retarder has not been penetrated by screed stakes and that base set screed posts are in place.

3.5 ADJUSTING

- A. Patch penetrations with pressure sensitive tape and make adjustments as necessary to maintain performance of vapor retarder as instructed by manufacturer.
- B. Do not patch or seam when vapor retarder is wet.

3.6 CLEANING

- A. Dispose of all waste material in accordance with project's Waste Management Plan.

3.7 PROTECTION

- A. Protect From Penetration: Do not permit use of ground set stakes, screed posts, and other items to puncture vapor retarder. Where punctured, remove penetrating item and patch vapor retarder, as specified in this section, before placing concrete.
- B. Lay plywood or other protection board over installed vapor retarder at areas of heavy traffic and other construction loads. Do not stack construction materials directly on vapor retarder.

3.8 SCHEDULE

- A. Locations: All slab on grade locations unless otherwise indicated.

END OF SECTION

SECTION 04 20 00 - UNIT MASONRY

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Concrete Masonry Units (CMU).
- B. Mortar and grout.
- C. Steel reinforcing bars.
- D. Miscellaneous masonry accessories.

1.2 RELATED REQUIREMENTS

- A. 07 62 00 - Sheet Metal Flashing and Trim: For coping cap.
- B. 007 90 05 - Joint Sealers

1.3 SUBMITTALS

- A. Qualification Data: For manufacturer, fabricator, and installer.
- B. Product Data: Provide product criteria, characteristics, accessories, jointing and seaming methods, and termination conditions.
 - 1. Include material properties and test reports substantiating compliance with project requirements.
 - 2. Size Variation Data: For brick or block.
 - 3. Efflorescence Rating: In accordance with ASTM C67: For exposed brick.
 - 4. Durability: In accordance with ASTM C67; 50 cycles of freezing and thawing.
 - 5. Strength: provide data and calculations establishing average net-area compressive strength for masonry units used in structural assemblies.
 - 6. Steel reinforcing bars.
 - 7. Joint reinforcement.
 - 8. Anchors, ties, and metal accessories.
 - 9. Cementitious Materials include:
 - a. Brand, type, and name of manufacturer.
 - b. Description of mix design and proportions of ingredients.
- C. Shop Drawings: Indicate required flashings, control joints, and expansion joints, sealing at openings, projections, and penetrations.
 - 1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
 - 2. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement."
 - 3. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.
 - 4. Detail Drawings: Submit elevation or overall drawings at 1/2 inch equal to 1 foot scale and detail drawings of a minimum 1-1/2 inch equal to 1 foot scale showing:
 - a. Bar splice locations.
 - b. Wall elevations exposed to view indicating the location of all cut masonry products.
 - c. Location and diagrams of all bent bars.
 - d. Wall dimensions, bar clearances, and all openings greater than one masonry unit in area.
 - e. Control joints.
- D. Certificate: When using bricks containing contaminated soil: Certification by manufacturer that the hazardous waste is neutralized by the manufacturing process and that no additional pollutants will be released.
- E. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods for cementitious materials and accessories.

- F. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
 - G. Maintenance Data: For user operation and maintenance of system including:
 - 1. Methods for maintaining system's materials and finishes.
 - 2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.
- 1.4 QUALITY ASSURANCE
- A. Manufacturer Qualification: Company specializing in the manufacture of work specified in this section with minimum 5 years of experience.
 - B. Fabricators Qualifications: Company specializing in performing the work of this section with minimum 5 years of experience on projects of similar size and complexity.
 - C. Installer Qualifications: Company specializing in performing the work of this section with minimum of 5 years of experience.
 - 1. Certified member in good standing with the Washington State Conference of Mason Contractors (WSCMC) or Mason Contractors Association of Oregon (MCAO).
- 1.5 DELIVERY, STORAGE, AND HANDLING
- A. Deliver, store, and handle material to avoid chipping, breakage, and contact with soil or contaminating materials.
 - B. Do not ship facing units to site until Architect approves sample panel.
 - C. Store masonry units in accordance with ASTM C90.
 - D. Store moisture sensitive materials in dry, weathertight enclosures.
- 1.6 WARRANTY
- A. Installation Warranty: Contractor shall correct defective Work within a 2 year period after Date of Substantial Completion; remove and replace materials concealing waterproofing at no extra cost to Owner.
- 1.7 ENVIRONMENTAL CONDITIONS
- A. General: Conform to ASTM D1790 for hot and cold weather masonry construction.
 - B. Hot Weather:
 - 1. Take the following precautions if masonry is erected when:
 - a. The ambient air temperature is more than 99 degrees F. (37 degrees C.) in the shade and the relative humidity is less than 50 percent.
 - b. The ambient air temperature exceeds 90 degrees F. (30 degrees C.) and the wind velocity is more than 8 mph (13 km).
 - 2. Shade masonry materials from direct sunlight; spread mortar beds no more than 4 feet ahead of masonry; set masonry units within one minute of spreading mortar; and after erection, protect masonry from direct exposure to wind and sun for 48 hours.
 - C. Cold Weather:
 - 1. Take the following precautions if masonry is erected when:
 - a. Ambient temperature or mean daily air temperature falls below 40 degrees F. (4 degrees C.)
 - b. Temperature of masonry units is below 40 degrees F. (4 degrees C.)
 - 2. Provide supplemental heat to achieve required ambient temperature of air and materials.

PART 2 PRODUCTS

2.1 DESCRIPTION

- A. Exterior assemblies of concrete masonry units including concrete masonry units and installation materials.

2.2 PERFORMANCE AND DESIGN CRITERIA

- A. Blend brick to produce a uniform appearance when installed and avoid an observable banding or layering of colors or textures.
- B. Follow details and specifications for size, layout, and grouting of structural unit masonry walls. Coordinate net-area compressive strength requirements with Architect.
 - 1. Determine net-area compressive strength as follows:
 - a. Unit Strength Method: Compressive strength of units and mortar per Tables 1 and 2 in ASTM D1790 / ASTM C1405 / TMS 402/602.
 - b. Prism Method: Test masonry prisms in accordance with ASTM C1314.

2.3 GENERAL

- A. Obtain masonry units from a single manufacturer for each type of unit used.
- B. Obtain Cementitious materials from a single manufacturer for each type used.

2.4 CONCRETE MASONRY UNITS (CMU)

- A. Complying with ASTM C652.
- B. Compressive strength for each type of unit required per ASTM C140/C140M.
- C. Aggregates: Lightweight aggregates and blends of lightweight and heavier aggregates in proportions used in producing the units that comply with the following requirements when tested for stain-producing iron compounds in accordance with ASCE 6.
 - 1. By visual classification method, the iron stain deposited on the filter paper shall not exceed the "light stain" classification.
- D. Slag: Comply with ASTM C989/C989M per project requirements.
- E. Cement: Low alkali content.
- F. Unit Sizes: As indicated. Standard units are nominally 4, 6, 8, 10, and 12 inch thick by 8 inches tall x 16 inches long.
- G. Sheet metal coping cap: as indicated on drawings. See section 07 62 00 - Sheet Metal Flashing and Trim.

2.5 CEMENTITIOUS MATERIALS

- A. Portland Cement: Complying with ASTM C150/C150M.
- B. Masonry Cement: Complying with ASTM C91/C91M.
- C. Sand: Complying with ASTM C144.
- D. Water: Clean, potable, and free from substances which could adversely affect the mortar.
- E. Fly Ash: Complying with ASTM C641, Class F.
 - 1. Cement-lime mortar: 40 percent maximum with type IP cement.
- F. Mortar Coloring: Colorant specifically made for use in masonry mortar.
 - 1. Added to the mortar used for exposed masonry surfaces to produce a uniform color.
 - 2. Quantity of pigment required to match approved samples.
 - 3. Color: Plain grey mortar.
- G. Cold Weather Accelerating Admixture: Complying with ASTM C494/C494M non-corrosive, containing less than 0.2 percent chlorides.
- H. Masonry Mortar: Complying with ASTM C270.
 - 1. Mortar Types: Conform to the proportion specification of ASTM C270.
 - a. Type S cement-lime mortar: 1 part cement, 1/2 part lime, and 4-1/2 parts aggregate.
 - 2. Air-Content: When structural reinforcement is incorporated.
 - a. Cement-lime mortar: 12 percent maximum.
 - b. Masonry cement mortar: 18 percent maximum.
 - 3. Admixture: Liquid, integral water-repellent, bond-enhancing admixture for masonry mortar.
 - a. Basis of Design: DRY-BLOCK Mortar Admixture by GCP Applied Technologies.
- I. Grout:

1. General: Comply with ASTM C476, with minimum compressive strength of 2,000 psi when tested in accordance with ASTM C1019.
 - a. Slump: 8 to 10 inches as measured by ASTM C143/C143M.
 - b. Grout Mix: Provide factory-blended hydraulic cement-based products containing the following minimum components:
 - 1) Portland cement or blended cement: ASTM C150/C150M Types I, IA, II, IIA, III or IIIA.
 - 2) Portland Cement or Blended Cement: ASTM C593 Types IS, IS(MS), IS-A, IS-A(MS), IP, or IP-A.
 - 3) Portland cement or Blended Cement: ASTM C595/C595M Types GU, HE, MS, or HS.
 - 4) Fly Ash: ASTM C618.
 - 5) Aggregate: ASTM C404.
 - 6) Water: Clean and free from deleterious acids, alkalies, and organic matter.
 - c. Coarse Grout: Adjust aggregate proportions as necessary to provide an evenly graded mix which will be easily pumped, with coarse aggregate content no greater than maximum specified in the proportion specifications of ASTM C476.
 - d. Grout Barriers for vertical cores: Made of fine mesh wire, fiberglass, or expanded metal.
 - J. Packaged Mortar Material:
 1. Complying with ASTM C1142, Types RN, RS, and RM.
 2. Exceeds performance of the field-mixed mortar design.
 - K. Packaged Dry Material for Grout for Masonry:
 1. Complying with ASTM C476 with the addition of water only.
 2. Exceeds performance of the field-mixed grout design.
- 2.6 ACCESSORIES
- A. Joint Reinforcement:
 1. Factory fabricated from steel wire conforming to ASTM A1064/A1064M, welded construction.
 - a. Tack welding will not be acceptable in reinforcement used for wall ties.
 - 1) Wire with a zinc coating conforming to ASTM A153/A153M, Class B-2.
 - 2) Wires with a minimum gauge per project requirements.
 - 3) Reinforcement: Ladder type design, having one longitudinal wire in the mortar bed of each face shell for hollow units and one wire for solid units.
 - 4) Joint reinforcement: Place a minimum of 5/8 inch cover from either face. The distance between cross wires will not exceed 16 inches. Furnish Joint reinforcement for straight runs in flat sections not less than 10 ft. long.
 - 5) Joint reinforcement provide with factory formed corners and intersections.
 - B. Bar Positioners:
 1. Use to prevent displacement of reinforcing bars during the course of construction.
 2. Provide factory fabricated from 9 gauge steel wire or equivalent, and coated with a hot-dip galvanized finish.
 3. Allow no more than one wire to cross the cell.
 4. Telescoping bar positioners: Manufactured from AISI 1065 spring steel and coated in accordance with ASTM B633.
 - C. Preformed Control Joints:
 1. Rubber or PVC material. Provide with corner and tee accessories, fused joints Control Joint.

- D. Cavity Mortar Control:
 - 1. Provide factory-manufactured synthetic mortar netting comprised of high-density polyethylene (HDPE) strands woven into a 90 percent open mesh. Profiled as a dovetail with alternating heights to prevent mortar droppings from restricting weep.
- E. Cleaning Solution:
 - 1. Non-acidic, not harmful to masonry work or adjacent materials.
 - 2. Basis of Design: Sure Klean 600 Detergent by ProSoCo or a comparable product by one of the following:
 - a. Evonik Corporation.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- F. Anti-Graffiti Coatings:
 - 1. Clear-drying, spray-applied, water-based silicone emulsion for weatherproofing concrete and graffiti control for block and other porous masonry materials. Active content not less than 6 percent. VOC content conform to thresholds set forth by all federal, state, local jurisdictions, and sustainable certificate requirements if sought.
- G. Graffiti Cleaner:
 - 1. Solvent based, multi-surface graffiti remover free of halogenated solvents, formulated for masonry substrates.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION

- A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION - GENERAL

- A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.
- B. Coordinate masonry work with the work of other trades to accommodate built-in items and to avoid cutting and patching. Lay masonry units in the bond pattern per project requirements. Adjust each unit to its final position while mortar is still soft and plastic.
- C. Remove clean and re-lay units that have been disturbed after the mortar has stiffened, with fresh mortar. Keep free from mortar and other debris air spaces, cavities, chases, expansion joints, and spaces to be grouted.
- D. Select units used at the exposed masonry surface from those having the least amount of chipped edge or other imperfections detracting from the appearance of the finished work.
- E. Keep units being laid and surfaces to receive units free of water film and frost. Mortar for veneer wythes: Bevel and slope toward the center of the wythe from the cavity side.
- F. Shove units into place so that the vertical joints are tight.
- G. Completely fill vertical joints of brick and the vertical face shells of concrete masonry units with mortar, except where indicated at control, expansion, and isolation joints
- H. Mortar will be permitted to protrude up to 1/2 inch into the space or cells to be grouted.
- I. Unfinished Work:
 - 1. Step back unfinished work for joining with new work. Tothing may be resorted to only when specifically approved. Remove loose mortar and thoroughly clean the exposed joints before laying new work.
- J. Cutting and Fitting: Use full units of the proper size wherever possible. Use power masonry saws and skilled masonry mechanics for cutting and fitting, including that required to accommodate the work of others.
 - 1. Concrete masonry units may be cut wet or dry.

2. Dry wet cut units, before being placed in the work. Dry to the same surface-dry appearance as uncut units being laid.
 3. Cut edges clean, true, and sharp.
 - K. Jointing: Tool joints when the mortar is thumbprint hard. Tool horizontal joints last. Brush joints to remove all loose and excess mortar. Mortar joints finishes:
 1. Tooled Joints (slightly concave):
 - a. Use at joints in exposed exterior and interior masonry surfaces.
 - b. Tool with a jointer slightly larger than the joint width so that complete contact is made along the edges of the unit.
 - c. Perform so that the mortar is compressed and the joint surface is sealed.
 - d. Use a jointer of sufficient length to obtain a straight and true mortar joint.
 2. Joints Between Dissimilar Materials:
 - a. Seal joints between masonry and dissimilar materials with backer rod and sealant, unless otherwise directed by EOR.
 - L. Embedded Items:
 1. Fill spaces around built-in items with mortar. Point openings around flush-mount electrical outlet boxes in wet locations with mortar.
 2. Embed anchors, ties, wall plugs, accessories, flashing, pipe sleeves and other items required to be built-in as the masonry work progresses.
 3. Fully embed anchors, ties and joint reinforcement in mortar. Fill cells receiving anchor bolts and cells of the first course below bearing plates with grout.
 - M. Joint reinforcement:
 1. Install joint reinforcement at 16 inches on center or as indicated. Lap reinforcement not less than 6 inches.
 2. Install prefabricated sections at corners and wall intersections. Place the longitudinal wires of joint reinforcement to provide not less than 5/8 inch cover to either face of the unit.
- 3.4 FIELD QUALITY CONTROL
- A. Testing:
 1. Mortar Test: For each mix type required.
 - a. Compressive strength: ASTM C109/C109M.
 - b. Water retention: ASTM A899.
 - c. Air content: ASTM C91/C91M.
 2. Grout Test: Compressive strength for each mix required per ASTM C1019.
- 3.5 CLEANING
- A. Dispose of all waste material in accordance with project's Waste Management Plan.
 - B. Remove excess mortar and grout from surface units.
- 3.6 PROTECTION
- A. Do not apply uniform loads for at least 12 hours or concentrated loads for at least 72 hours after masonry is constructed. Provide temporary bracing as required.
- 3.7 MASONRY WATER REPELLENT AND GRAFFITI CONTROL
- A. Strictly conform to manufacturer's published instructions prior to commencement of sealer application.
 - B. Ensure sealers will not promote a deleterious effect on adjacent wall system components.
 - C. Project adjacent areas and finishes not intended to receive masonry sealers. Do not permit sealer to run off masonry onto glazing, fixtures, flashings, or joint sealants. Ensure joint sealants have adequately cured or are protected as required prior to application of sealers.

- D. Dilute sealers with clean, potable water with mixing vessels free of contaminants. Apply solution to masonry surfaces immediately after mixing.
- E. Install sealers "wet-on-wet" to a visibly dry and absorbent surface.
- F. Spray Application: Saturate starting from bottom, creating a 4 to 8 inch rundown below contact point. Allow first application to penetrate for a minimum of 3 minutes. Resaturate.
- G. Roller Application: Saturate surface in a uniform manner. Allow first application to penetrate for a minimum of 3 minutes. Brush out heavy runs.
- H. Protect treated surfaces from rain for 4 hours until visibly dry.
- I. Clean tools and equipment immediately with soap and warm water.

END OF SECTION

SECTION 05 12 00 - STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Structural steel framing members.
- B. Plates, connectors, bolts, anchors.

1.2 RELATED REQUIREMENTS

- A. 05 50 00 - Metal Fabrications: for miscellaneous steel fabrications and other steel items not defined as structural steel.

1.3 REFERENCE STANDARDS

- A. AISC 303 - Code of Standard Practice for Steel Buildings and Bridges 2016.
- B. AISC 360 - Specification for Structural Steel Buildings 2016.
- C. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength 2014.
- D. ASTM A490 - Standard Specification for Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength 2014a.
- E. ASTM F1852 - Standard Specification for "Twist Off" Type Tension Control Structural Bolt/Nut/Washer Assemblies, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength 2011.
- F. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020.
- G. SSPC-SP 2 - Hand Tool Cleaning 2018.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Show fabrication of structural-steel components.
 - 1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
 - 2. Include embedment Drawings.
 - 3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
 - 4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections.
 - 5. Identify members and connections of the Seismic-Load-Resisting System.
 - 6. Indicate locations and dimensions of protected zones.
 - 7. Identify demand critical welds.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer, fabricator, shop-painting applicators, and professional engineer
- B. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- C. Product Test Reports: For the following:
 - 1. Direct-tension indicators.
 - 2. Shop primers.
 - 3. Nonshrink grout.
- D. Survey of existing conditions.
- E. Source quality-control reports.
- F. Field quality-control and special inspection reports.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD

1. Non AISC-Certified Fabricators shall have five years minimum experience on similar projects of equal or larger complexity and scope. Qualifications shall be submitted two weeks prior to bid.
 - B. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CSE.
 1. Non AISC-Certified Installers shall have five years minimum experience on similar projects of equal or larger complexity or scope. Qualifications shall be submitted two weeks prior to bid.
 - C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 1. Welders and welding operators performing work on bottom-flange, demand-critical welds shall pass the supplemental welder qualification testing, as required by AWS D1.8/D1.8M. FCAW-S and FCAW-G shall be considered separate processes for welding personnel qualification.
 - D. Comply with applicable provisions of the following specifications and documents:
 1. Per Structural drawings.
- 1.7 DELIVERY, STORAGE, AND HANDLING
- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.
 1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
 - B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
 1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
 2. Clean and relubricate bolts and nuts that become dry or rusty before use.
 3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F1852 fasteners and for retesting fasteners after lubrication.

PART 2 PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

- A. As indicated in Structural drawings.

2.2 GROUT

- A. Per Structural drawings.

2.3 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," and to AISC 360.
 1. Camber structural-steel members where indicated.
 2. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.
- B. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.
- C. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.
- D. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 2, "Hand Tool Cleaning."
- E. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.

1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.4 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A325 or ASTM A490 Bolts" for type of bolt and type of joint specified.
 1. Joint Type: Pretensioned
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
 1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

2.5 SOURCE QUALITY CONTROL

- A. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.
- B. Bolted Connections: Shop-bolted connections will be inspected according to RCSC's "Specification for Structural Joints Using ASTM A325 or A490 Bolts."
- C. Welded Connections: In addition to visual inspection, shop-welded connections will be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
 1. Liquid Penetrant Inspection: ASTM E165.
 2. Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
 3. Ultrasonic Inspection: ASTM E164.
 4. Radiographic Inspection: ASTM E94.
- D. In addition to visual inspection, shop-welded shear connectors will be tested and inspected according to requirements in AWS D1.1/D1.1M for stud welding and as follows:
 1. Bend tests will be performed if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
 2. Tests will be conducted on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1/D1.1M.
- E. Prepare test and inspection reports.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.
 1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

3.3 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.

- B. Baseplates, Bearing Plates, and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
 - 1. Set plates for structural members on wedges, shims, or setting nuts as required.
 - 2. Weld plate washers to top of baseplate.
 - 3. Pretension anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
 - a. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- C. Maintain erection tolerances of structural steel within AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds and high-strength bolted connections.
- B. Bolted Connections: Bolted connections will be inspected according to RCSC's "Specification for Structural Joints Using ASTM A325 or A490 Bolts."
- C. Welded Connections: Field welds will be visually inspected according to AWS D1.1/D1.1M.
 - 1. In addition to visual inspection, field welds will be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
 - a. Liquid Penetrant Inspection: ASTM E165.
 - b. Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
 - c. Ultrasonic Inspection: ASTM E164.
 - d. Radiographic Inspection: ASTM E94.
- D. In addition to visual inspection, test and inspect field-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:
 - 1. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
 - 2. Conduct tests on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1/D1.1M.
- E. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

END OF SECTION

SECTION 05 50 00 - METAL FABRICATIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Non-structural steel framing and supports.
- B. Metal fabrications.

1.2 RELATED REQUIREMENTS

- A. 09 90 00 - Painting and Coating: Field applied paint finish.

1.3 SUBMITTALS

- A. Product Data: On all cleaning, galvanizing, and finishing products, including VOC content.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
- C. Maintenance Data: For user operation and maintenance of system including:
 - 1. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

PART 2 PRODUCTS

2.1 DESCRIPTION

- A. Items designed and shop fabricated out of steel and aluminum sections, tubing, plates and pipe for exposed and concealed locations.

2.2 MATERIALS

- A. Steel:
 - 1. Steel Sections: ASTM A36/A36M
 - 2. Steel Tubing: ASTM A500/A500M, Grade B cold-formed structural tubing.
 - 3. Plates: ASTM A283/A283M
 - 4. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.
 - 5. Slotted Channel Framing: ASTM A653/A653M, Grade 33.
 - 6. Slotted Channel Fittings: ASTM A1011/A1011M
 - 7. Fasteners: To suit application. Unless noted otherwise, match fasteners exposed to view with the material and color/finish of the material being fastened if metal; color and finish if not metal. Fasteners not exposed to view: Galvanized steel unless otherwise note
 - 8. Bolts, Nuts, and Washers: ASTM A325 (ASTM A325M), Type 1, galvanized to ASTM A153/A153M where connecting galvanized components.
 - 9. Welding Materials: AAWS D1.1/D1.1M; type required for materials being welded.
 - a. AWS D1.1/D1.1M; type required for materials being welded.
 - 10. Touch-Up Primer for Galvanized Surfaces: See Section 09 90 00.
- B. Stainless Steel:
 - 1. Stainless-Steel Sheet, Strip, and Plate: ASTM A240/A240M or ASTM A666, Type 304.
 - 2. Tubing: ASTM A554, Grade MT 304.
 - 3. Pipe: ASTM A312/A312M, Grade TP 304.
 - 4. Castings: ASTM A743/A743M, Grade CF 8 or CF 20.
 - 5. Stainless-Steel Bars and Shapes: ASTM A276/A276M, Type 304.
 - 6. Rolled-Stainless-Steel Floor Plate: ASTM A 793.

7. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F593; with hex nuts, ASTM F594.
- C. Aluminum:
1. Extruded Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.
 2. Sheet Aluminum: ASTM B209 (ASTM B209M), 5052 alloy, H32 or H22 temper.
 3. Aluminum-Alloy Drawn Seamless Tubes: ASTM B210 (ASTM B210M), 6063 alloy, T6 temper.
 4. Aluminum-Alloy Bars: ASTM B211 (ASTM B211M), 6061 alloy, T6 temper.
 5. Aluminum-Alloy Sand Castings: ASTM B26/B26M.
 6. Aluminum-Alloy Die Castings: ASTM B85/B85M.
 7. Bolts, Nuts, and Washers: Stainless steel
 8. Welding Materials: AWS D1.2/D1.2M; type required for materials being welded.
- 2.3 FABRICATION
- A. Fit and shop assemble items in largest practical sections, for delivery to site.
 - B. Fabricate items with joints tightly fitted and secured.
 - C. Continuously seal joined members by continuous welds.
 - D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
 - E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
 - F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
- 2.4 FABRICATED ITEMS
- A. (L-1) Intake Louver
 1. Size and location as indicated on drawings.
 2. 50% open, galvanized steel frame and drainable blades, powder coated finish to match adjacent wall finish.
- 2.5 FABRICATION TOLERANCES
- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
 - B. Maximum Offset Between Faces: 1/16 inch.
 - C. Maximum Misalignment of Adjacent Members: 1/16 inch.
 - D. Maximum Bow: 1/8 inch in 48 inches.
 - E. Maximum Deviation From Plane: 1/16 inch in 48 inches.
- 2.6 FINISHES
- A. Steel:
 1. Prime paint all steel items.
 - a. Exceptions:
 - 1) Galvanize items to be embedded in concrete or masonry.
 - 2) Galvanize items specified for galvanized finish.
 - 3) Do not prime surfaces indicated for spray fire proofing, weathering steel or blackened steel finish.
 - 4) Field welding is required.
 - b. See Section 09 90 00 - Painting and Coating for field finish painting.
 2. Prime Painting: One coat.
 3. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M or ASTM A153/A153M requirements. Provide minimum 1.7 oz/sq ft galvanized coating.

4. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating
 - B. Stainless Steel:
 1. #4 Satin.
 - C. Aluminum:
 1. Typical Exterior Aluminum Surfaces: Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick.
 2. Typical Interior Aluminum Surfaces: Class II Natural Anodized Finish: AAMA 611 AA-M12C22A31 Clear anodic coating not less than 0.4 mils thick.
 3. Apply one coat of bituminous paint to concealed aluminum surfaces in contact with cementitious or dissimilar materials.
- 2.7 ACCESSORIES
- A. All accessory materials required by the fabricator for a complete installation of the installed products in a manner that meets the Performance and Design Criteria.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components indicated.
- D. Perform field welding in accordance with AWS D1.1/D1.1M.
- E. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.3 INSTALLATION TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

3.4 CLEANING

- A. Dispose of all waste material in accordance with project's Waste Management Plan.

3.5 PROTECTION

- A. Protect installed work as required by the fabricator to maintain finishes, product performance, design criteria, and warranty.

3.6 SCHEDULE

- A. Bollards: Steel pipe, concrete filled, crowned cap; shop primed, field finished.
- B. Ledge Angles, Shelf Angles, Channels, Backing Plates and Plates Not Attached to Structural Framing: For support of metal decking; prime paint finish.
- C. Anchor bolts, steel pipe, cast in masonry anchors, pipe protection.

END OF SECTION

SECTION 06 10 00 - ROUGH CARPENTRY

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Structural dimension lumber framing
- B. Nonstructural dimension lumber framing
- C. Rough opening framing for doors, windows, and roof openings.
- D. Sheathing
- E. Roof-mounted curbs
- F. Roofing nailers
- G. Roofing cant strips
- H. Preservative treated wood materials
- I. Miscellaneous framing and sheathing
- J. Communications and electrical room mounting boards
- K. Concealed wood blocking, nailers, and supports.
- L. Miscellaneous wood nailers, furring, and grounds.

1.2 SUBMITTALS

- A. Qualification Data: For fabricator.
- B. Product Data: Provide product criteria, characteristics, accessories, jointing and seaming methods, and termination conditions.
- C. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

1.3 QUALITY ASSURANCE

- A. Manufacturer Qualification: Company specializing in the manufacture of work specified in this section with minimum 5 years of experience.
- B. Fabricators Qualifications: Company specializing in performing the work of this section with minimum 5 years of experience on projects of similar size and complexity.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

PART 2 PRODUCTS

2.1 DESCRIPTION

- A. Provide miscellaneous rough carpentry items including preservative treated wood materials, roof-mounted curbs, miscellaneous wood nailers, furring, and grounds.

2.2 PERFORMANCE AND DESIGN CRITERIA

- A. Provide Preservative-Treated Wood in locations required by ICC (IBC)-2018, Section 2304.12.1 through 2304.12.7, "Locations requiring water-borne preservatives or naturally durable wood," complying with the following requirements:
 - 1. Comply with American Wood Protection Association AWPA U1 and AWPA M4.
 - 2. Identification of Preservative-Treated Wood:
 - a. Provide all preservative-treated wood, identified in accordance with ICC (IBC)-2018, Section 2303.1.9.1, to include: identification of the treating manufacturer; type of preservative used; minimum preservative retention (pcf); end use for which the product is treated; AWPA standard to which the product was treated; identity of the accredited inspection agency.
 - 3. Moisture Content of Preservative-Treated Wood:
 - a. Where preservative-treated wood is used in enclosed locations where drying in service cannot readily occur, such wood shall be at a moisture content of 19 percent

or less before being covered with insulation, interior wall finish, floor covering or other materials; in accordance with ICC (IBC)-2018, Section 2302.1.9.2.

4. Fastener requirements at Preservative-Treated Wood:
 - a. Fasteners and connectors in contact with preservative-treated wood and fire-retardant-treated wood, in accordance with ICC (IBC)-2018, Section 2304.10.5; ASTM A153/A153M, ASTM F1667.
 - 1) Fasteners or connectors for preservative-treated wood, including exceptions, in accordance with ICC (IBC)-2018, Section 2304.10.5.1.

2.3 DIMENSIONAL LUMBER

- A. Species and grades as indicated on the Structural drawings.
- B. Comply with DOC PS 20 and with applicable grading rules of inspection agencies certified by the American Lumber Standards Committee's (ALSC) Board of Review. Provide dressed lumber, S4S, with each piece factory marked with grade stamp of inspection agency.
- C. Miscellaneous Lumber:
 1. Provide No. 3 or Standard grade lumber of any species for support or attachment of other construction, including rooftop equipment curbs and support bases, cant strips, bucks, nailers, blocking, and similar members.

2.4 STRUCTURAL COMPOSITE LUMBER

- A. Structural Composite Lumber: Factory fabricated beams, headers, and columns, of sizes and types indicated on drawings; structural capacity as published by manufacturer.
 1. Columns/Posts/Studs: Per Structural drawings.
 2. Beams: Per Structural drawings.

2.5 CONSTRUCTION PANELS

- A. Roof Sheathing as required for repairs: Rating, classification, span rating and performance category as indicated on Drawings.
- B. Wall Sheathing as required for repairs: Rating, classification, span rating, and performance category as indicated on Drawings.
- C. Wall Sheathing: Plywood, per Structural drawings.. Communications and Electrical Room Mounting Boards: PS 1 A-D plywood, or medium density fiberboard; 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.

2.6 ACCESSORIES

- A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.
- B. Fasteners and Anchors:
 1. Metal and Finish: Stainless steel for exterior, high humidity or preservative-treated wood locations, unfinished steel elsewhere.
- C. Sill Flashing:
 1. Sill Flashing: As specified in Section 07 62 00 - Sheet Metal Flashing and Trim.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION

- A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION - GENERAL

3.4 FRAMING INSTALLATION

- A. Refer to Structural drawings.

3.5 BLOCKING, NAILERS, AND SUPPORTS

- A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
- B. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to code authorities may be used in lieu of solid wood blocking.
- C. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.
- D. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.
- E. Provide the following specific non-structural framing and blocking:
 - 1. Handrails.
 - 2. Grab bars.
 - 3. Towel and bath accessories.
 - 4. Wall paneling and trim.
 - 5. Joints of rigid wall coverings that occur between studs.

3.6 ROOF-RELATED CARPENTRY

3.7 INSTALLATION OF CONSTRUCTION PANELS

- A. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using nails, screws, or staples.
 - 1. Use plywood or other acceptable structural panels at building corners, for not less than 96 inches, measured horizontally.
 - 2. Provide inlet diagonal bracing at corners.

3.8 TOLERANCES

- A. Framing Members: 1/4 inch from true position, maximum.
- B. Surface Flatness of Floor: 1/8 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.9 CLEANING

- A. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.
- B. Prevent sawdust and wood shavings from entering the storm drainage system.
- C. Dispose of all waste material in accordance with project's Waste Management Plan.

3.10 PROTECTION

- A. Protect installed work as required by the manufacturer to maintain product performance, design criteria and warranty.

3.11 SCHEDULE

- A. Preservative-treated wood materials:
 - 1. Any wood required to be treated by the local authority having jurisdiction.
 - 2. Classification and location as indicated.

END OF SECTION

SECTION 06 41 00 - ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Cabinetry.
- B. Cabinet Hardware.
- C. PLAM Clad Casework.

1.2 RELATED REQUIREMENTS

- A. 06 10 00 - Rough Carpentry: For hidden shelf supports.
- B. 09 90 00 - Painting and Coating: Site finishing of cabinet exterior.
- C. 12 36 00 - Countertops: for countertops installed with casework.

1.3 SUBMITTALS

- A. Qualification Data: For fabricator and installer.
- B. Product Data: Provide data for hardware, accessories, and finishes.
- C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
 - 1. Minimum Scale of Detail Drawings: 1-1/2 inch to 1 foot.
 - 2. Provide the information required by AWI/AWMAC/WI (AWS) Architectural Woodwork Standards.
 - 3. Provide schedule of drawer locations where soft-close drawer slide features are not available; Architect to review and revise style as required.
- D. Sample: Submit sample of cabinet panel construction, minimum 12 inches square, illustrating proposed cabinet substrate and finish.
- E. Hardware Samples: Submit actual sample items of proposed pulls, hinges, shelf standards, and locksets, demonstrating hardware design, quality, and finish.
- F. Certificate: Submit certification of required wood products, produced from wood complying with FSC STD-01-001, FSC Principles and Criteria for Forest Stewardship.
- G. Manufacturer's Installation Instructions: For finishes and hardware. Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.
- H. Maintenance Data: For user operation and maintenance of system including:
 - 1. Methods for maintaining system's materials and finishes.
 - 2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.

1.4 MAINTENANCE MATERIAL

- A. Furnish extra materials described below, before installation begins, that match products installed, are packaged with protective covering for storage, and are identified with labels clearly describing contents.

1.5 QUALITY ASSURANCE

- A. Fabricators Qualifications: Company specializing in performing the work of this section with minimum 5 years of experience on projects of similar size and complexity.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum of 5 years of experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. As required by the quality standard and fabricator for a warrantable installation of the installed products to meet the Performance and Design Criteria.

PART 2 PRODUCTS

2.1 DESCRIPTION

- A. Custom designed and fabricated casework plastic laminate over MDF core and associated accessories and hardware.

2.2 SELECTED INDUSTRY GRADES

- A. Quality Grade: Unless otherwise indicated provide products of quality specified by AWI/AWMAC/WI (AWS) Architectural Woodwork Standards.
 - 1. Pattern matching for wood grain veneers and plastic laminate patterns based on selected grade and as indicated below:
 - a. Custom Grade: Doors, drawer fronts and false fronts wood grain and laminate pattern to run and match vertically within each cabinet unit.
 - 2. Veneer Grades in accordance with HPVA HP-1:
 - a. Veneer Grade definitions:
 - 1) A: Where AA premium face grade is not required, but excellent appearance is still important.
 - 2) B: Where the natural characteristics and appearance of the species are desirable.
 - 3. Project Required Veneer Grades:
 - a. Exposed Surfaces: Grade A.
 - b. Semi-Exposed Surfaces: Grade A.
 - c. Concealed Surfaces: Grade B.

2.3 MATERIALS

- A. Countertop Edge Materials:
 - 1. Lumber: Maximum moisture content of 6 percent; with vertical grain, of quality suitable for transparent finish.
 - 2. Hardwood Edgebanding: Use matching species, color, grain, and grade for exposed portions of wood veneer cabinetry.
- B. Plastic Laminate Materials:
 - 1. Specification is based on products listed below.
 - 2. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.
 - a. Horizontal Surfaces: HGS, 0.048 inch nominal thickness.
 - b. Vertical Surfaces: VGS, 0.028 inch nominal thickness.
 - c. Flame Retardant Surfaces: HGF, 0.048 inch nominal thickness.
 - d. Cabinet Liner: CLS, 0.020 inch nominal thickness.
 - e. Laminate Backer: BKL, 0.020 inch nominal thickness, undecorated; for application to concealed backside of panels faced with high pressure decorative laminate.

2.4 CABINET HARDWARE

- A. Drawer Slides:
 - 1. Basis of Design: Accuride International, Inc.
 - 2. Performance Criteria:
 - a. Rated medium duty grade for drawer size indicated.
 - 1) Drawer slides rated for 100 lbs. minimum; soft-close feature available.
 - b. Rated extra heavy-duty grade for drawer size indicated.
 - 1) Drawer slides rated for 250 lbs. minimum; soft-close feature not available.
 - c. Trash, recycle, and compost drawer slides rated for 500 lbs. minimum; soft-close feature not available.
 - 3. Features:

- a. Full extension.
 - b. Soft-close, stay-closed feature where indicated above.
- B. Door and Drawer pulls:
 1. Basis of Design: Bravo Finger Pull by Berenson Decorative Hardware.
 2. Performance Criteria:
 - a. ADA Standards Compliant.
 3. Features:
 - a. Finish: Brushed nickel.
 - b. Lengths: Available from 1-3/4 inches to 9 inches.
 - c. Required lengths as indicated on drawings.
- C. Hinges: European-style, concealed, opening to 135 degrees; soft-closing.
- D. Seat and Counter Support Brackets:
 1. Basis of Design: Hidden Support Brackets by CenterLine Brackets.
 2. Accepted substitutions: Brackets meeting performance criteria and features matching the Basis of Design profile
 3. Performance Criteria:
 - a. Capacity: 450 lbs./bracket.
 4. Features:
 - a. Hidden support bracket.
 - b. Style and Length: As required by condition.
 - c. Inside wall configuration.

2.5 ACCESSORIES

- A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION

- A. Prepare surfaces to receive work in accordance with Quality Standards.

3.3 INSTALLATION

- A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.
- B. Assemble cabinets and complete fabrication.
- C. Anchor cabinets to structure. Secure with countersunk, concealed fasteners
 1. For shop finished items, use color matched wood filler.
- D. Install cabinets level, plumb, and true in line to a tolerance of 1/8 inch in 96 inches using concealed shims.
 1. Scribe and cut cabinets to fit adjoining work and repair damaged finish at cuts.
 2. Install cabinets without distortion so doors and drawers fit openings and are accurately aligned.
 3. Maintain veneer sequence matching of cabinets with transparent finish.
- E. Shop Finishes: Touch up finishing after installation of architectural cabinets. Fill nail holes with matching filler.
 1. Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats are shop applied.

3.4 ADJUSTING

- A. Adjust and lubricate hardware for proper operation. Adjust hardware to center doors and drawers in openings and to provide smooth operation. Complete installation of hardware and

accessory items as indicated.

3.5 CLEANING

- A. Dispose of all waste material in accordance with project's Waste Management Plan.

3.6 PROTECTION

- A. Protect installed work as required by the manufacturer to maintain product performance, design criteria, and warranty.

3.7 SCHEDULE

A. (LAM-1)

- 1. Manufacturer: Wilsonart
- 2. Style Number/Name: High Pressure Laminate - Aeon Scratch Resistance Laminate
 - a. Finish: Vapor Strandz 4939K - 18 Linearity

END OF SECTION

SECTION 07 25 00 - WEATHER BARRIERS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Mechanically Fastened Weather Barrier Sheet.
- B. Flexible Flashings.

1.2 RELATED REQUIREMENTS

- A. 07 54 00 - Thermoplastic Membrane Roofing: Vapor retarder and air barrier components installed in conjunction with roofing membrane.
- B. 07 62 00 - Sheet Metal Flashing and Trim: Metal flashings installed in conjunction with weather barriers.

1.3 DEFINITIONS

- A. Weather Barrier: Assemblies that form water-resistive barriers, air barriers, or vapor retarders.
- B. Air Barrier: Air tight barrier made of material that is relatively air impermeable but water vapor permeable, both to the degree specified, with sealed seams and with sealed joints to adjacent surfaces.
- C. Vapor Retarder: Air tight barrier made of material that is relatively water vapor impermeable, to the degree specified, with sealed seams and with sealed joints to adjacent surfaces.
- D. Water-Resistive Barrier: Water-shedding barrier made of material that is moisture-resistant, to the degree specified, intended to be installed to shed water without sealed seams.

1.4 SUBMITTALS

- A. Qualification Data: For manufacturer and installer.
- B. Product Data: Provide product criteria, characteristics, accessories, jointing and seaming methods, and termination conditions.
- C. Shop Drawings: Indicate extents, special joint or termination conditions, and conditions of interface with other materials. Indicate line of continuous air barrier at building exterior.
- D. Manufacturer's Field Service Reports: Provide site reports from authorized field service representative, indicating observation of air barrier system installation.
- E. Test Report: Submit report of full-size mockup test for NFPA 285 fire performance.
- F. Field test results.
- G. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, perimeter conditions requiring special attention, and storage and handling criteria.
- H. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualification: Company specializing in the manufacture of work specified in this section with minimum 5 years of experience with local product representation available to review product installation.
- B. Installer Qualifications: Company specializing in performing the work of this section, using specified materials with minimum 5 years of experience on projects of similar size and complexity.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

1.7 WARRANTY

- A. Manufacturer's warranty for air barrier for a period of ten (10) years from date of Purchase.

1. Preinstallation meeting and jobsite observations by air barrier manufacturer may be required for specified warranty.

PART 2 PRODUCTS

2.1 DESCRIPTION

- A. Components of vapor retarder and air barrier assemblies under opaque cladding; including liquid, sheet, and flexible transition flashings.

2.2 PERFORMANCE AND DESIGN CRITERIA

- A. Air Permeability:
 1. The system: Air permeability not to exceed 0.04 cfm/ft² under a pressure differential listed, when tested per ASTM E2357
- B. Air Infiltration: 0.004 cfm/sq ft maximum per ASTM E283.
- C. Fire Performance: Tested in accordance with, and complying with the acceptance criteria of, NFPA 285; testing must be performed specifically for this project.
- D. Fire Performance: Combustible exterior wall coverings shall be tested in accordance with NFPA 268.
 1. 2012 IBC.1406.1.1.

2.3 MATERIALS

- A. Fully Adhered Weather Barrier Sheet.
 1. Verify compatibility for installation over existing WRB.
 2. Specification is based on WrapShield with Integrated Tape by VaproShield LLC.
 3. Performance Criteria:
 - a. Water Vapor Permeance: 50 perms, nominal, when tested in accordance with ASTM E96/E96M.
 4. Features:
 - a. Material Thickness: 0.02 inches nominal.
 - b. Ultraviolet and Weathering Resistance: Approved in writing by manufacturer for minimum of 6 months weather exposure.
- B. Mechanically Fastened Vapor Retarder Sheet.
 1. Vapor Retarder: Specification is based on MemBrain by Certainteed.
 - a. Substitutions for products by manufacturers other than those listed above: See Section 01 60 00 - Product Requirements.
 2. Performance Criteria:
 - a. Water Vapor Permeance: 1 perm or less when tested to ASTM E96/E96M, dry cup method and increases to greater than 10 perms using the wet cup method.
 - b. Corrosivity: No unusual aspect of corrosion such as pitting, cracking and adhesion cure inhibition, tested per ASTM C665.
 - c. Fungi Resistance: No growth, tested per ASTM C1338.
 - d. Surface Burning Characteristics: Tested per ASTM E84.
 - 1) Flame Spread Index: Maximum 20.
 - 2) Smoke Developed Index: Maximum 55.
 3. Features:
 - a. Material: Polyamide film.
 - b. Thickness: 2 mil.
- C. Flexible Flashings.
 1. Liquid Flashing Membrane: Product recommended by weather barrier manufacturer to maintain performance criteria while transitioning to rough openings.
 2. Self-Adhering Flexible Flashing: SBS-modified bituminous sheet membrane, 30 mil minimum thickness, laminated to a cross-laminated polyethylene film, in factory cut

widths.

- a. Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Flashing product recommended by weather barrier manufacturer.
 - 2) W.R. Grace & Company Perm-A-Barrier Detail Membrane.
 - 3) Henry; Blueskin SA.
 - 4) Tremco, Inc.; ExoAir 110/110LT.
3. Foil-faced self-adhered flashing: SBS-modified or butyl based bituminous sheet membrane, 30-40 mil thickness, integrally laminated to a glass scrim reinforced aluminum foil, in factory cut widths.
 - a. Protecto Wrap PS45.
 - b. Henry Blueskin Metal Clad
4. High Temperature Self-Adhering Membrane Flashing: Meeting AAMA 711 specification for heat exposure range Level 3 Service temperature over 176 degrees: Butyl based bituminous sheet membrane, 30-40 mil thickness, laminated to a cross-laminated polyethylene film, in factory cut widths. One of the following:
 - a. Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Blueskin PE 200HT by Henry Company.
 - 2) CCW-705 HT by Carlisle Coatings & Waterproofing Inc.
 - 3) Lastobond Shield HT by Soprema Inc.
5. Liquid Mastic: Liquid mastic recommended by flashing manufacturer.
6. Primers, Cleaners, Insulation Adhesive, Joint Compound, and Sealant Materials: As recommended by air barrier manufacturer, appropriate to application, and compatible with adjacent materials.

2.4 ACCESSORIES

- A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.
- B. Liquid Flashing Membrane:
 1. At locations recommended by air and water-resistant membrane manufacturer.
- C. Primer:
 1. Liquid waterborne or solvent-borne primer recommended for substrate by air and water barrier material manufacturer.
- D. Counter-flashing and Transition Strips:
 1. Modified bituminous or butyl based, 40-mil thick, self-adhering sheet flashing, polyethylene or foil carrier sheet as location and function dictate.
- E. Liquid-Applied Flashing:
 1. Manufacturer's recommended gun-grade waterproofing, adhesive, and detailing company that combines the best of silicone and polyurethane properties. The single component, Silyl-Terminated-Poly-Ether (STPE) produces a highly durable, seamless, elastomeric that should treat joints, seams, cracks, and provide the flashing membrane in rough openings of structural walls and to counter-flash waterproofing and air barrier components.
- F. Joint Reinforcing Strip:
 1. Manufacturer's joint reinforcing tape.
- G. Substrate-Patching Membrane:
 1. Manufacturer's standard trowel-grade substrate filler.
- H. Adhesive and Tape:
 1. Manufacturer's standard adhesive and pressure-sensitive adhesive tape.

- I. Metal Flashings:
 - 1. Per 07 62 00 - Sheet Metal Flashing and Trim.
- J. Sprayed Polyurethane Foam Sealant:
- K. Joint Sealant:
 - 1. Low expansion foam complying with AAMA 812
 - 2. Basis of Design: Froth Pak by Dow Chemical
 - 3. Performance Criteria:
 - a. Two-component closed-cell urethane foam with low-expansion pressure, 10 percent flexibility, and 1.75 to 2.0 lb/cu. ft., suitable for installation adjacent to fenestration.
- L. Air Barrier Sealant:
 - 1. Manufacturer's recommended sealant to seal field sheet-applied air barrier membrane to sheet-applied air barrier membrane; seal field sheet-applied air barrier membrane to self-adhered membrane; seal membrane flashing around opening to vinyl windows and doors.
- M. Termination Mastic:
 - 1. Fluid or sheet-applied air and water barrier manufacturer's standard cold fluid-applied elastomeric liquid; trowel grade.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION

- A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION

- A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.
- B. Follow specific requirements for lapping and integration with flashings described in the details to form an air and weather tight installation.
- C. Where primer is required, primer substrates at a rate required by air and water barrier manufacturer and allow it to dry. Limit priming to areas that will be covered by material on same day. Re-prime areas exposed for more than 24 hours.
- D. Connect and seal exterior wall air and water barrier material continuously to the following areas where applicable, using accessory materials as indicated in the Drawings:
 - 1. Roofing-membrane, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings.
- E. Install air and water barrier as recommended by the manufacturer around window and door rough openings and at penetrations after sheathing is installed and penetrations have been secured. Provide minimum overlaps as require.
- F. Coordinate installations with Section 07 62 00 - Sheet Metal Flashing and Trim to provide airtight transitions within the air and weather barrier membrane including but not limited to rough opening and penetration heads, ledger angles, and cross cavity through wall flashings. Install tapes and sealant continuously as required to provide an airtight installation.
- G. Secure and/or adhere the air and weather barrier system as required by manufacturer.
- H. Ensure that air and weather barrier is airtight, free from holes, tears, and punctures.
- I. Cover air and weather barrier system within manufacturer's recommended exposure timeframe.

3.4 CLEANING

- A. Clean dust, dirt, and debris from the surface of air and water-resistant barriers prior to installation of furring and/or cladding materials.
- B. Dispose of all waste material in accordance with project's Waste Management Plan.

3.5 PROTECTION

- A. Protect air and water barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.
 - 1. Protect air and weather barrier from exposure to UV light and harmful weather exposure as required by manufacturer. If exposed to these conditions for longer than manufacturer's recommended timeframe, remove and replace fluid-applied air and weather barrier or install additional, full-thickness, fluid-applied air and weather barrier application after repairing and preparing the overexposed membrane according to fluid-applied air and weather barrier manufacturer's written instructions.
 - 2. Protect fluid-applied air and weather barrier from contact with incompatible materials and sealants not approved by fluid-applied air and weather barrier manufacturer.
- B. Repair damage before proceeding with subsequent construction.
- C. Clean spills, stains, and soiling from construction that would be exposed in the completed work using cleaning agents and procedures recommended by manufacturer of affected construction.
- D. Remove masking materials after installation.

END OF SECTION

SECTION 07 31 13 - ASPHALT SHINGLES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Asphalt shingle roofing.
- B. Underlayment
- C. Associated metal flashings and accessories.

1.2 RELATED REQUIREMENTS

- A. 07 62 00 - Sheet Metal Flashing and Trim: Edge and cap flashings.

1.3 SUBMITTALS

- A. Qualification Data: For manufacturer and installer.
- B. Product Data: Provide product criteria, characteristics, and accessories.
- C. Shop Drawings: Indicate required flashings and accessories.
- D. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.
- E. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- F. Maintenance Data: For user operation and maintenance of system including:
 - 1. Methods for maintaining system's materials and finishes.

1.4 MAINTENANCE MATERIAL

- A. Extra Shingles: 1 package of each type and color.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualification:
 - 1. Company specializing in the manufacture of work specified in this section with minimum 10 years of experience.
 - 2. Associate member in good standing of either the National Roofing Contractors Association (NRCA), Western States Roofing Contractors Association (WSRCA) or the Midwest Roofing Contractors Association (MRCA).
- B. Installer Qualifications:
 - 1. Company specializing in performing the work of this section with minimum 5 years experience, operating under the same name and ownership for those 5 years.
 - 2. A single installer (contractor) shall perform the work, including sheet metal work, as required by this specification.
 - 3. Approved by the manufacturer to install the specified products and provide the specified warranties.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.
- B. At ambient temperatures of 70 degrees or greater, take care not to scuff the shingles as they are being installed. In temperatures of 70 degrees or greater shingles must be stored in the shade. Scuffed shingles to be replaced to the satisfaction of owner's representative.
- C. Roof deck shall be clean and dry before any roofing work proceeds. Roofing shall not proceed during precipitation, nor when moisture from dew is present, or if precipitation or other moisture source is expected. Roofer shall remove no more roofing than can be covered with new underlayment and shingles in the same day. If unable to install shingles, exposed underlayment shall be covered with tarps.
- D. Protection against staining, mechanical damage, and live loads shall be provided for adjacent surfaces as required during application of roofing

1.7 WARRANTY

- A. Installation Warranty: Contractor shall correct defective Work within a 2 year period after Date of Substantial Completion.
- B. Manufacturer Warranty: Provide Lifetime material year warranty for shingles.
- C. Provide the owner with a 30-year manufacturer's warranty.

PART 2 PRODUCTS

2.1 DESCRIPTION

- A. Complete roofing assemblies, including factory formed asphalt shingles and installation accessories, tested for conformance with performance criteria.

2.2 PERFORMANCE AND DESIGN CRITERIA

- A. Fire Resistance: Class A, when tested in accordance with ASTM D3462/D3462M.
- B. Wind Resistance: Class F, when tested in accordance with ASTM D3161/D3161M.
- C. Warranted Wind Speed: Not less than tested wind resistance.

2.3 MATERIALS

- A. Asphalt Shingles: Asphalt-coated glass felt, mineral granule surfaced, complying with ASTM D3462/D3462M.
 - 1. Basis of Design: Landmark by CertainTeed. Comparable and substituted products will be judged based on the following performance criteria, features, warranty, and qualifications.
 - 2. Features:
 - a. Algae Resistant.
 - b. Color: Match existing asphalt shingles.
- B. Underlayment: felt reinforced with fiber glass fibers saturated with asphalt, complying with ASTM D6757 and ASTM D4869/D2260
 - 1. Basis of Design: CertainTeed Roofers' Select
 - 2. Features:
 - a. 15 lbs.

2.4 ACCESSORIES

- A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.
- B. Manufacturer's optional accessories required by the project:
 - 1. Self-Adhering Membrane: Grace Ultra or approved equal.
 - 2. Nails: Hot dipped galvanized nails (ring shank) for hand nailing of shingles. Staples and pneumatically driven nails not allowed. Nails shall fully penetrate through the underside of the plywood sheathing.
 - 3. Asphaltic-based plastic cement conforming to ASTM D4586/D3409.
 - 4. Fasteners: Hot dipped galvanized roofing nails for nailing of shingles. Staples are not allowed. Nails shall fully penetrate through the underside of the plywood sheathing.

2.5 METAL FLASHING AND TRIM

- A. General: Comply with requirements in Section 07 62 00 Sheet Metal Flashing and Trim
- B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of the item.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION

- A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION

- A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.
- B. Install secondary products which are acceptable to, and approved by, the manufacturer of asphalt shingles.
- C. Install self-adhered membrane at all valleys, eaves, and rakes as shown in the drawings.
- D. Install underlayment perpendicular to the slope of the roof lapping each course over the lower course at least 4 inches. Where end laps join, lap six inches minimum.
- E. Install specified fiberglass reinforced shingles in accordance with manufacturer's instructions using hot dipped galvanized nails, over the underlayment. Install shingles "book style" with trimmed tab starter course, four nails per shingle. Nails are to be placed flush with the shingle surface. Overdriven, underdriven, crooked nails, and nails placed high will not be accepted.
- F. Install the starter course with an overhang at the eaves and rakes as recommended by the manufacturer.
- G. Mechanical Equipment Curbs and Pipe Penetrations: Raise conduit penetrations, insulated pipes, soil stacks, vents, and mechanical curbs as necessary to obtain a minimum eight (8) inch flashable height above the finished roof plane (unless otherwise shown in the drawings). Include rewiring and duct extensions as necessary to raise or extend conduit or ducts. Perform all work necessary to reinstall and reconnect equipment to fully functioning. All electrical, mechanical, and gas line work to be performed by a journeyman worker experienced and trained in work performed to building code and current industry standards.
- H. Install metal flashings and other sheet metal to comply with requirements in Section 07 62 00 Sheet Metal Flashing and Trim
- I. Install rake and eave drip-edge flashings over underlayment and fasten roof to deck.

3.4 CLEANING

- A. Dispose of all waste material in accordance with project's Waste Management Plan.

3.5 PROTECTION

- A. Protect installed work as required by the manufacturer to maintain product performance, design criteria, and warranty.

3.6 SCHEDULE

- A. Schedule locations of different assemblies.

END OF SECTION

SECTION 07 46 46 - FIBER CEMENT SIDING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fiber cement siding and trim.

1.2 RELATED REQUIREMENTS

- A. 02 41 19 - Selective Demolition
- B. 07 25 00 - Weather Barriers
- C. 07 62 00 - Sheet Metal Flashing and Trim
- D. 07 90 05 - Joint Sealers

1.3 SUBMITTALS

- A. Qualification Data: For manufacturer, design engineer, and installer.
- B. Product Data: Provide product criteria, characteristics, accessories, jointing and corner methods, and termination conditions.
- C. Shop Drawings: Indicate extents, special joint or termination conditions, and conditions of interface with other materials.
- D. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.
- E. Maintenance Data: For user operation and maintenance of system including:
 - 1. Methods for maintaining system's materials and finishes.
 - 2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in the manufacture of work specified in this section with minimum 5 years of experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years of experience on projects of similar size and complexity.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

1.6 WARRANTY

- A. Manufacturer Warranty: Provide manufacturer warranty for 30 years. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.1 FIBER CEMENT SIDING

- A. Lap Siding: Individual horizontal boards made of cement and cellulose fiber formed under high pressure with integral surface texture, complying with ASTM C1186, Type A, Grade II; with machined edges, for nail attachment.
- B. Basis of Design: HardiePlank by James Hardie Building Products Inc. Comparable and substituted products will be judged based on the following features.
- C. Features:
 - 1. Length 144 inch boards.
 - 2. Trim: Same material and texture as siding, 1" thickness, 3.5" width.
 - 3. Thickness: 0.312 inches.
 - 4. Widths: 8.25 inches.
 - 5. Exposures: 7 inches.
 - 6. Attachment Method: Concealed fasteners.
 - 7. Color: Primed for field painting: see Section 09 90 00 - Painting and Coating.

8. Finish: Cedarmill.

2.2 ACCESSORIES

- A. Fasteners:
 - 1. Manufacturer's standard type to suit application.
- B. Miscellaneous Sheet Metal Items:
 - 1. Provide flashings, trim, moldings, closure strips primed for field paint with siding.
- C. Furring Strips:
 - 1. As indicated on drawings.
- D. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION

- A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION

- A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.
- B. Coordinate with installation of associated counterflashings and other components installed under other sections.
- C. Finish Painting: Within one week after installation, paint siding and trim with one coat primer and two coats finish paint in accordance with Section 09 90 00 - Painting and Coating.

3.4 TOLERANCES

- A. Maximum Offset From True Alignment Between Adjacent Members Butting or In Line: 1/16 inch.
- B. Maximum Variation from Plane or Location Indicated on Drawings: 1/4 inch.

3.5 CLEANING

- A. Dispose of all waste material in accordance with project's Waste Management Plan.

3.6 PROTECTION

- A. Protect installed work as required by the manufacturer to maintain product performance, design criteria, and warranty.

END OF SECTION

SECTION 07 54 00 - THERMOPLASTIC MEMBRANE ROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Cover Board.
- B. Polyvinyl Chloride roofing membrane.
- C. Parapet Copings.
- D. Accessories: Walkway Pads, Prefabricated Curbs.

1.2 RELATED REQUIREMENTS

- A. 02 41 19 - Selective Demolition: for demolition of areas of existing roofing to facilitate new work and requirements to maintain existing roofing warranties.
- B. 06 10 00 - Rough Carpentry: Wood nailers, curbs and cant strips.
- C. 07 62 00 - Sheet Metal Flashing and Trim: Counterflashings and reglets.

1.3 SUBMITTALS

- A. Qualification Data: For Manufacturer and Installer.
- B. Product Data: Provide data indicating membrane materials, flashing materials, insulation, vapor retarder, surfacing, and fasteners.
- C. Shop Drawings: Provide data indicating membrane materials, flashing materials, insulation, vapor retarder, surfacing, and fasteners.
- D. Sample: Submit manufacturer's standard sample size.
- E. Fire Classification Test Report: Showing test reports for classification, assembly, application and roof slopes indicated.
- F. Installer's Field Reports: Indicate procedures followed, ambient temperatures, humidity, wind velocity during application, and supplementary instructions given.
- G. Manufacturer's Installation Instructions: Manufacturer's Installation Instructions: Indicate membrane seaming precautions and perimeter conditions requiring special attention.
- H. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- I. Maintenance Data: For user operation and maintenance of system including:
 - 1. Methods for maintaining system's materials and finishes.
 - 2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum 10 years of documented experience in PVC roof membrane manufacture.
- B. Installer Qualifications: Company specializing in performing the work of this section with a minimum five years of experience and approved by the manufacturer. Applicator shall have installed at least three (3) roofing applications of this type or similar (single-ply membrane) system of equal or greater size within the past three (3) years.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.
- B. Roof-covering materials shall be delivered in packages bearing the manufacturer's identifying marks and approved testing agency labels required in accordance with ICC (IBC)-2018 Section 1505. Bulk shipments of materials shall be accompanied with the same information issued in the form of a certificate or on a bill of lading by the manufacturer.
 - 1. ICC (IBC)-2018.1506.3.

1.6 WARRANTY

- A. Installation Warranty: Contractor shall correct defective Work within a 2-year period after Date of Substantial Completion.
- B. Manufacturer Warranty: Provide 20-year manufacturer's Total Roofing System (no dollar limit) Warranty covering all materials incorporated into the roof and labor.

PART 2 PRODUCTS

2.1 DESCRIPTION

- A. Single ply thermoplastic membrane roofing system including all manufacturer's required accessories for watertight, warrantable installation.

2.2 PERFORMANCE AND DESIGN CRITERIA

- A. Fire Classification: Class B per ASTM E108 or UL 790; for application and roof slopes indicated.
 - 1. ICC (IBC)-2018.1505.1.
- B. Slope: Thermoplastic single-ply membrane roofs shall have a design slope of a minimum of one-fourth unit vertical in 12 units horizontal (2-percent slope).
 - 1. ICC (IBC)-2018.1507.13.1.
- C. Exposure Category: As indicated.
 - 1. ICC (IBC)-2018.1504.8 Maximum mean roof height table.
- D. Nominal Design Wind Speed: As indicated.
 - 1. ICC (IBC)-2018.1504.8 Maximum mean roof height table.
- E. Wind Resistance: Roof coverings installed on roofs in accordance with Section 1507 that are mechanically attached or adhered to the roof deck shall be designed to resist the design wind load pressures for components and cladding in accordance with Section 1609.
 - 1. ICC (IBC)-2018.1504.3.
 - 2. Design Wind Load Pressure: As indicated.
- F. Perform work in accordance with NRCA Roofing and Waterproofing Manual, and manufacturer's instructions.
- G. Detail roofing system as required by membrane manufacturer to attain required warranty and comply with performance criteria indicated.
- H. Solar Reflectance Index (SRI): 78, minimum, calculated in accordance with ASTM E1980.
 - 1. Requirement for white roofing only.
 - 2. Field applied coating may not be used to achieve specified SRI.
- I. Thermal Emissivity: 0.80, minimum, initial, and 0.79, minimum, 3-year, certified by Cool Roof Rating Council.
 - 1. Requirement for white roofing only.

2.3 MANUFACTURERS

- A. Basis of Design:
 - 1. 80 Mil Sure-Flex KEE HP by Carlisle Roofing Systems, Inc.
 - 2. Duro-lasts' 80-mil Duro-Tuff Roofing Membrane System

2.4 MATERIALS

- A. Repair materials: Match existing materials as required to maintain the roofing warranty.
- B. Cover Board:
 - 1. Typical: Non-combustible, water-resistant gypsum core with embedded glass mat facers, complying with ASTM C1177/C1177M:
 - a. Basis of Design:
 - 1) As recommended by membrane manufacturer for installation indicated and in accordance with system performance testing.
 - b. Features:

- 1) Thickness: 1/2 inch.
 - C. Parapet Copings: Formed aluminum coping with galvanized steel anchor/support cleats for capping any parapet wall; watertight, maintenance free, without exposed fasteners; butt type joints with concealed splice plates; mechanically fastened as indicated.
 1. Performance:
 - a. At least the minimum required when tested in accordance with ANSI/SPRI ES-1 Test Method RE-3, current edition.
 - b. Provide product listed in current Factory Mutual Research Corporation Approval Guide with at least FM 1-90 rating.
 2. Features:
 - a. Material and Finish: 0.08 prefinished aluminum in accordance with Section 07 62 00 - Sheet Metal Flashing and Trim; matching concealed joint splice plates; factory-installed protective plastic film.
- 2.5 ACCESSORIES
- A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.
 - B. Conductive primer for Electronic Leak Detection: For application to cover board or other non-conductive substrate directly beneath membrane approved by primer manufacturer.
 1. Basis of Design: TruGround Conductive Primer by Detec Systems.
 2. TruGround is not intended to replace required adhesives or primers. Required adhesives and primers shall be applied after the TruGround has been applied and is dry. Coordinate with membrane manufacturer to determine if any products should be omitted due to use of TruGround, and to determine coating sequencing.
 - C. Wood Nailers:
 1. PS 20 dimension lumber, Structural Grade No. 2 or better Southern Pine, Douglas Fir; or PS 1, APA Exterior Grade plywood; pressure preservative treated.
 - D. Walkway Pad:
 1. Manufacturer's recommended product to increase viability and slip-resistance and puncture resistance in walkway areas.
 - a. Layout per Architectural Drawings.
 - E. Prefabricated Curbs:
 1. Frames:
 - a. Material: ASTM A 653 G90 hot-dipped Galvanized steel.
 - 1) Minimum 18 gauge or as engineered by manufacturer.
 - 2) Minimum 18 gauge for curbs supporting HVAC units
 - 3) Minimum 20 gauge for expansion joint curbs.
 - b. Corners: Mitered and welded (welds are micro-sealed and prime painted after fabrication). Bolted connections not accepted.
 - c. Internally reinforced with Galvanized 1 inch by 1 inch by 12 gauge angles for curbs exceeding 3 feet in length. Reinforce internal bulkhead at equipment curbs to support lateral loads.
 - d. Wood Nailers: Factory installed, pressure treated. Size and width as suitable for support of items installed on curbs.
 - d. Wood Nailers: Factory installed, pressure treated. Size and width as suitable for support of items installed on curbs.
 2. Insulation: Factory installed 2 inch thick three-pound density fiberglass insulation.
 3. Curb Height: Minimum 8 inch above finished roof.
 4. Construct curbs to match roof slope with plumb and level top surface for mounting mechanical equipment.

5. Gasketing: 1/4 inch thick, 1" wide at roof top units and skylights.
6. Counter Flashing: 18 gauge Galvanized steel.
7. Cants: Wood or fiber for built-up or modified bitumen roofing systems

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions meet the manufacturer's requirements before starting work.
- B. Do not start work until Pre-Installation Notice has been submitted to manufacturer as notification that this project requires a manufacturer's warranty.

3.2 PREPARATION

- A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION

- A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.

3.4 FIELD QUALITY CONTROL

- A. Inspection by Manufacturer: Provide final inspection of the roofing system by a Technical Representative employed by roofing system manufacturer specifically to inspect installation for warranty purposes.
- B. Perform all corrections necessary for issuance of warranty.

3.5 PROTECTION

- A. Protect installed work as required by the manufacturer to maintain product performance, design criteria, and warranty.

END OF SECTION

SECTION 07 62 00 - SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fabricated sheet metal items.

1.2 RELATED REQUIREMENTS

- A. 07 25 00 - Weather Barriers: Moisture protection and underlayments under sheet metal flashings.
- B. 07 90 05 - Joint Sealers: Sealants installed with sheet metal flashing and trim.

1.3 SUBMITTALS

- A. Qualification Data: For fabricator.
- B. Shop Drawings: Indicate material profile, jointing locations, jointing details, fastening methods, flashings, terminations, and installation details. Show layouts of sheet metal flashing and trim, including plans and elevations. Distinguish between shop and field assembled work. Include the following:
 - 1. Identify material, thickness, weight, and finish for each item and location in Project.
 - 2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
 - 3. Details for fastening, joining, supporting, and anchoring sheet metal flashing and trim, including fasteners to adjoining work.
- C. Samples:
 - 1. Finish Sample: Submit two samples illustrating each metal finish color.
 - 2. Fabrication Sample: Submit sample of coping lap joint as it will occur every 10 feet.
- D. Warranty: Submit manufacturer finish warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.4 QUALITY ASSURANCE

- A. Fabricators Qualifications: Company specializing in performing the work of this section with minimum 5 years of experience on projects of similar size and complexity.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

1.6 WARRANTY

- A. Manufacturer's Finish Warranty: Correct defective work within a 20 year period after Substantial Completion for degradation of panel finish, including color fading caused by exposure to weather.
 - 1. Panel Finish Criteria are listed AAMA 2605.

PART 2 PRODUCTS

2.1 DESCRIPTION

- A. Sheet metal including steel, stainless steel, and aluminum fabricated into items such as flashings, counterflashings, gutters, downspouts, and other items indicated and scheduled.

2.2 PERFORMANCE AND DESIGN CRITERIA

- A. General: Install sheet metal flashing and coping to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing, rattling, leaking, and fastener disengagement.
- B. Thermal Movements: Provide sheet metal flashing and trim that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects.

1. Temperature Change (Range): 120 degrees, ambient; material surfaces.

2.3 MATERIALS

- A. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 0.02 inch thick base metal, shop pre-coated with PVDF coating.
 1. Fluoropolymer Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.
 2. Color: As scheduled below and indicated on drawings.
- B. Pre-Finished Aluminum: ASTM B209; 0.032 inch thick; plain finish shop pre-coated with fluoropolymer coating.
 1. Fluoropolymer Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.
 2. Color: To be selected from manufacturer's standard colors.
- C. Stainless Steel: for masonry use: ASTM A666 Type 304, soft temper, 0.018 inch thick; smooth mill finish.
- D. Stainless Steel: For all other uses: ASTM A666 Type 304, rollable temper, 0.018 inch thick; smooth No. 4 finish.

2.4 FABRICATION

- A. Conform to referenced SMACNA manual, Manufacturer's recommendations if premanufactured and as detailed. Conform to following general requirements:
- B. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- C. Form pieces in longest possible lengths.
- D. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
- E. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.
- F. Hem exposed edges 1/2 inch on unexposed side, miter and seam corners, unless noted otherwise.
- G. Cleats: Fabricate continuous cleats and starter strips from one gauge heavier material than sheet metal material, in widths required by SMACNA, interlockable with sheet.
- H. Fully soldered/welded stainless steel saddle and transition flashings at 3-D transitions such as roof to wall intersections, roof to elevator overrun, and the like.
- I. Sealed Joints: Form non-expansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
- J. Expansion Provisions: Space movement joints at maximum of 10 feet with no joints allowed within 24 inches of corner or intersection, and as required by SMACNA. Where lapped or bayonet-type expansion provisions in work cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).
- K. Shingle laps in flashings: 6-inch minimum, sealed with two distinct beads of bib-skinning butyl sealant at each lap.

2.5 ACCESSORIES

- A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.
- B. Flexible Flashing:
 1. For use under metal copings and flashings Section 07 25 00 - Weather Barriers; use high temperature type.
- C. Slip Sheet:
 1. Rosin sized building paper.
- D. Protective Backing Paint: See Section 09 90 00 - Painting and Coating.

E. Sealant: As specified in Section 07 90 05 - Joint Sealers.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION

A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION

A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.

3.4 CLEANING

A. Dispose of all waste material in accordance with project's Waste Management Plan.

3.5 PROTECTION

A. Protect installed work as required by the manufacturer to maintain product performance, design criteria, and warranty.

3.6 SCHEDULE

A. Gutters:

1. Material: Pre-finished Aluminum.
2. Size: 5".
3. Color: To be selected from manufacturer's standard colors.
4. Seaming: Fully-welded shop fabricated corners and end dams.

B. Downspouts:

1. Material: Pre-finished Aluminum.
2. Size: 3" x 4".
3. Color: To be selected from manufacturer's standard colors.

C. Coping, Cap, Flashings:

1. Material: Prefinished Aluminum.
2. Thickness: 20 gauge/0.0320 inches
3. Color: To be selected from manufacturer's standard colors.
4. Seaming: Butt joint with concealed splice plates.
5. Corners: Fully-welded shop fabricated corners, ends and intersections.

END OF SECTION

SECTION 07 84 00 - FIRESTOPPING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Penetration firestopping.
- B. Fire resistive joint systems.

1.2 RELATED REQUIREMENTS

- A. 09 21 16 - Gypsum Board Assemblies: For fire rated assemblies requiring firestopping.
- B. Divisions 21-28: For items typically penetrating fire rated assemblies requiring firestopping.

1.3 SUBMITTALS

- A. Qualification Data: For manufacturer and fabricator.
- B. Product Data: Provide product criteria, characteristics, accessories, and jointing methods, and termination conditions.
- C. Shop Drawings: Indicate system design listing by UL, FM Research, Intertek Testing Services, Omega Point Laboratories (OPL).
 - 1. Where system design listing is not available for a particular configuration provide an Engineering Judgment (EJ) or Equivalent Fire Resistance Rated Assembly (EFRA) for submittal
- D. Contractor Installation log.
- E. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.
- F. Maintenance Data: For user's operation and maintenance of system including:
 - 1. Methods for maintaining system's materials.

1.4 QUALITY ASSURANCE

- A. Manufacturer of firestop products shall have been successfully producing and supplying these products for a period of not less than 3 years, and be able to show evidence of at least 10 projects where similar products have been installed and accepted.
- B. Fabricators Qualifications: Company specializing in performing the work of this section with minimum 5 years of experience on projects of similar size and complexity.

1.5 MOCKUP

- A. Prior to installing firestopping, erect mockups for each different firestop system indicated to verify selections made and to demonstrate qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for final installations.
 - 1. Locate mockups on site in locations indicated or, if not indicated, as directed by Owner.
 - 2. Retain and maintain mockups during construction in an undisturbed condition as a standard for judging completed unit of Work. Accepted mockups in an undisturbed condition at time of Substantial Completion may become part of completed unit of Work.

1.6 WARRANTY

- A. Installation Warranty: Contractor shall correct defective Work within a five year period after Date of Substantial Completion.
- B. Manufacturer Warranty: Provide five year warranty for firestopping systems.

PART 2 PRODUCTS

2.1 DESCRIPTION

- A. Interior Firestopping: Provide firestopping of all joints head of walls and penetrations in fire-resistance rated and smoke-resistant assemblies. Single source installer.

2.2 PERFORMANCE AND DESIGN CRITERIA

- A. Penetrations: Provide firestopping systems that resist the spread of fire, and the passage of smoke and other gases according to requirements indicated:

1. Firestop all penetrations passing through fire resistance rated wall and floor assemblies and other locations as indicated on the drawings.
 2. Provide complete penetration firestopping systems that have been tested and approved by third party testing agency.
 3. F - Rated Through-Penetration Firestop Systems: Provide through-penetration firestop systems with F ratings indicated, as determined per ASTM E814, but not less than one hour or the fire-resistance rating of the construction being penetrated.
 4. T - Rated Through-Penetration Firestop Systems: Provide firestop systems with T ratings, in addition to F ratings, as determined per ASTM E814, where indicated by Code.
 5. Provide T-Rating Collar Devices tested in accordance with ASTM E814 or ANSI/UL 1479 for metallic pipe penetrations requiring T-Ratings per the applicable building code.
 6. L - Rated Through-Penetration Firestop Systems: Provide firestop systems with L ratings, in addition to F and T ratings, as determined per UL 1479, where indicated by Code.
 7. W - Rated Through-Penetration Firestop Systems: Provide firestop systems with W Water Resistance ratings, in addition to F, T and L ratings, as determined per UL 1479, where indicated.
- B. Perimeter Fire Containment Systems: Provide interior perimeter joint systems with fire-resistance ratings indicated, as determined per ASTM E2307, but not less than the fire-resistance rating of the floor construction.
- C. Fire-Resistive Joints: Provide joint systems with fire-resistance ratings indicated, as determined per UL 2079, but not less than the fire-resistance rating of the construction in which the joint occurs.
- D. For firestopping exposed to view, traffic, moisture, and physical damage, provide appropriate firestop systems for these conditions.
1. Exposed to view firestopping must be paintable.
- E. Firestop material must be able to be installed per manufacturers written instructions in temperatures ranging from 35 degrees F to 120 degrees F, and have the ability to be frozen, thawed and still comply with its UL designation and testing results.
- F. Provide products that upon curing, do not re-emulsify, dissolve, leach, breakdown or otherwise deteriorate over time from exposure to atmospheric moisture, sweating pipes, ponding water or other forms of moisture characteristic during and after construction.
- G. Movement:
1. Provide firestop sealants and fire resistive joint sealants sufficiently flexible to accommodate motion such as pipe vibration, water hammer, thermal expansion and other normal building movement without damage to the seal.
 2. Provide fire-resistive joint sealants designed to accommodate a specific range of movement and tested for this purpose in accordance with a cyclic movement test criteria as outlined in Standards, ASTM E-1399, ASTM E1966, or ANSI/ UL 2079.
- H. Pipe insulation shall not be removed, cut away or otherwise interrupted through wall or floor openings. Provide products appropriately tested for the thickness and type of insulation utilized.
- I. Fire rated pathway devices shall be the preferred product and shall be installed in all locations where frequent cable moves, add-ons and changes will occur.
- J. When mechanical cable pathways are not practical, openings within walls and floors designed to accommodate voice, data and video cabling shall be provided with re-enterable products specifically designed for retrofit.
- K. Penetrants passing through fire-resistance rated floor-ceiling assemblies contained within chase wall assemblies shall be protected with products tested by being fully exposed to the fire outside of the chase wall. Systems within the UL Fire Resistance Directory that meet this

criterion are identified with the words "Chase Wall Optional".

- L. Provide penetration firestop systems, fire-resistive joint systems, or perimeter fire barrier systems subjected to an air leakage test conducted in accordance with Standard, ANSI/ UL 1479 for penetrations and ANSI/UL 2079 for joint systems with published L-Ratings for ambient and elevated temperatures as evidence of the ability of firestop system to restrict the movement of smoke.

2.3 MANUFACTURERS

- A. Basis of Design: 3M Fire Protection Products as listed in assemblies shown on Drawings or approved equal.
 - 1. Comparable products by one of the following are also acceptable. See Section 01 60 00 - Product Requirements for submittal requirements.

2.4 HEAD OF WALL ASSEMBLIES AT FIRE RESISTIVE JOINT ASSEMBLIES

- A. Metal Stud / Gypsum Board Partition Head-of-Wall Assembly:Based on UL assemblies listed on the Drawings.
 - 1. Track:
 - a. Basis of Design:Cemco "FAS Track DL2"; 20 gage (33 mil) track with factory installed intumescent seal; include "Fas Shaft Track DL2" for application at shaft wall assemblies; Include "Cemco Fas Strap" for installation of partitions against fluted metal decks; width as appropriate to flute spacing.

2.5 ACCESSORIES

- A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of firestopping.

3.2 PREPARATION

- A. Priming: Prime substrates where recommended by firestopping manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond. Do not allow spillage and migration onto exposed surfaces.
- B. Masking Tape: Use masking tape to prevent firestopping from contacting adjoining surfaces that will remain exposed. Remove tape as soon as it is possible to do so without disturbing the firestopping seal with substrates.
- C. Verify that system components are clean, dry, and ready for installation.
- D. Verify that field dimensions are as shown on the Drawings and as recommended by the manufacturer.

3.3 PENETRATION FIRESTOP INSTALLATION

- A. Ensure that all pipes, conduit, cable, and other items, which penetrate fire rated construction, have been permanently installed prior to installation of firestop assemblies.
- B. Ensure that partitions and all other construction that conceal penetrations are not erected prior to the installation of firestop and smoke seals.
- C. Install forming/damming materials and other accessories in accordance with manufacturers written instructions.
- D. Install fill materials for through-penetration firestop systems by proven techniques to produce the following results:
 - 1. Completely fill voids and cavities formed by openings, forming materials, accessories, and penetrating items.

2. Install materials so they contact and adhere to substrates formed by openings and penetrating items.
3. For fill materials that will remain exposed finish to produce smooth, uniform surfaces.

3.4 FIRESTOP JOINT SYSTEM INSTALLATION

- A. Install joint fillers to provide support of firestop materials during application.
- B. Provide at the position to produce the cross-sectional shapes and depths of installed firestop material relative to joint widths for optimum sealant movement capability and required fire-resistance.
- C. Install systems that result in firestop materials:
 1. Directly contacting and fully wetting joint substrates.
 2. Completely filling recesses provided for each joint configuration.
 3. Providing uniform, cross-sectional shapes and depths relative to joint width that optimize movement capability.
- D. Tool non-sag firestop materials immediately after application and prior to skinning begins. Form smooth, uniform beads of configuration indicated or required to:
 1. Produce fire-resistance rating.
 2. Eliminate air pockets.
 3. Ensure contact and adhesion with sides of joint.

3.5 INSTALLATION LOG

- A. Include the following items for all firestop and fire resistive joint installations:
 1. Contractor's name, address, and phone number.
 2. Through-penetration firestop systems designation of applicable testing and inspecting agency.
 3. Date of installation.
 4. Firestop systems manufacturer's name.
- B. Provide as a pdf file with bi-directional links to floor plans and elevations to clearly illustrate location of material.

3.6 IDENTIFICATION

- A. Identify through-penetration firestop systems with pressure-sensitive, self-adhesive, preprinted vinyl labels. Attach labels permanently to surfaces of penetrated construction on both sides of each firestop system installation where labels will be visible to anyone seeking to remove penetrating items or firestop systems.

3.7 CLEANING

- A. Clean off excess fill materials and sealants adjacent to openings and joints as work progresses. Use methods and cleaning materials approved by manufacturers of firestopping products and or assemblies in which openings and joints occur.
- B. Protect firestopping during and after curing period from contact with contaminating substances.

3.8 SCHEDULE

- A. Refer to assemblies on drawings.

END OF SECTION

SECTION 07 90 05 - JOINT SEALERS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Sealants for exterior surfaces.
- B. Sealants for interior surfaces.

1.2 SUBMITTALS

- A. Qualification Data: For Manufacturer, Installer, Testing Agency.
- B. Product Data: Provide data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, and color availability.
- C. Preliminary Selection Sample: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- D. Field Samples for Confirmation: Provide sealant samples in the color selected based on Manufacturer's charts for sealants other than the ones included in the Visual and Performance Mockup. Field samples shall be minimum 12 inches long and installed at joints intended for each particular sealant use. Mockup and field samples will be used to confirm sealant color selection.
- E. SWRI Validation Certificate: For each elastomeric sealant specified to be validated by SWRI's Sealant Validation Program.
- F. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.
- G. Preconstruction Field Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on preconstruction testing specified in "Quality Assurance" Article.
- H. Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:
 - 1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 - 2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
- I. Field Test Report Log: For each elastomeric sealant application.
- J. Product Test Reports: Based on comprehensive testing of product formulations performed by a qualified testing agency, indicating that sealants comply with requirements.
- K. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- L. Maintenance Data: For user operation and maintenance of system including:
 - 1. Methods for maintaining system's materials and finishes.
 - 2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.
 - 3. Recommendations on maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in the manufacture of work specified in this section with minimum 5 years of experience.
- B. Installer Qualifications: Manufacturer's authorized Installer who is approved or licensed for installation of elastomeric sealants required for this Project. Minimum 5 years of documented experience in facilities of this size and scope.
 - 1. Prequalification of single source installers for exterior sealants is encouraged.
- C. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

1.5 WARRANTY

- A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Ten (10) years from date of Substantial Completion.
- C. Special warranties exclude deterioration or failure of elastomeric joint sealants from the following:
 - 1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
 - 2. Disintegration of joint substrates from natural causes exceeding design specifications.
 - 3. Mechanical damage caused by individuals, tools, or other outside agents.
 - 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 PRODUCTS

2.1 DESCRIPTION

- A. Joint sealers for properly designed joints in interior and exterior materials; selected for durability, movement capacity, adhesion to substrates and non-staining characteristics.

2.2 PERFORMANCE AND DESIGN CRITERIA

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.
- C. Elastomeric Sealants: Comply with ASTM C920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C920 classifications for type, grade, class, and uses related to exposure and joint substrates.
- D. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C1248 and have not stained porous joint substrates indicated for Project.

2.3 MANUFACTURERS

- A. Specification is based on products listed below.

2.4 MATERIALS

- A. Sealants for exterior surfaces:
 - 1. (S-1): Silyl-terminated polyether elastomeric; ASTM C920, Grade NS, Class 25, Uses NT, M, G, A and O; single, or multi- component.
 - a. Color: Standard and custom colors matching finished surfaces.
 - b. Product: BASF MasterSeal NP 150
 - 2. (S-2): Silicone Sealant: ASTM C920, Grade NS, Class 50, Uses NT, A, G, M, O; single component, general purpose, medium modulus, neutral curing, non-sagging, non-staining, non-bleeding.

- a. Movement Capability: +/- 50 percent.
 - b. Color: Standard colors matching finished surfaces.
 - c. Product: DOWSIL 795 manufactured by Dow.
 - d. Designed for weather-proofing typical exterior materials including unprimed adhesion to anodized and fluoropolymer coated aluminum.
3. (S-3): Butyl Sealant: ASTM C1311.
 - a. Movement Capability: Plus and minus 12-1/2 percent.
 - b. Product: Butyl Sealant by Tremco.
 - c. Designed for concealed joints requiring non-drying sealant like lap joints in sheet metal flashing and trim.
 4. (S-4): Concrete Paving Joint Sealant: Polyurethane, self-leveling; ASTM C920, Class 25, Uses T, I, M and A; single or multi-component.
 - a. Movement Capability: +/- 25 percent.
 - b. Color: Color as selected to match concrete.
 - c. Product: THC 901 by Tremco Inc.
 - d. Designed for exposed, trafficked joints with pourable self-leveling installation.
 5. (S-5): Preformed Compressible Foam Sealers.
 - a. Movement +25 percent, -25 percent (50 percent total) - permanently elastic.
 - b. Color: Color as selected to match concrete.
 - c. Product: THC 901 by Tremco Inc.
 - 1) Backerseal by Emseal.
 - 2) illmod 600 by Tremco Inc.
- B. Sealants for interior surfaces:
1. (S-6): General Purpose Interior Sealant: polyurethane; single, or multi- component, paintable.
 - a. Color: Standard colors matching finished surfaces.
 - b. Product: Dymonic FC, Dymeric 240FC by Tremco Inc.
 - c. Designed for interior movement and non-moving joints adjacent to painted surfaces.
 2. (S-7): Bathtub/Tile Sealant: Silicone; ASTM C920, Uses M and A; single component, mildew resistant.
 - a. Colors other than white may be required.
 - b. Product: DOWSIL Tub and Tile Sealant manufactured by Dow.
 - c. Sealant Used in Food preparation area must be USDA approved for that use.
 3. (S-8): Acoustical Sealant: Acrylic sealant; ASTM C834.
 - a. Product: Tremco "Acoustical Sealant".
 - b. Non-hardening type.
 - c. Tested as part of acoustical assemblies.
- ## 2.5 ACCESSORIES
- A. Joint sealant backing:
1. General:
 - a. Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
 2. Cylindrical Sealant Backings:
 - a. ASTM C1330, Type C (closed-cell material with a surface skin), O (open-cell material), B (bicellular material with a surface skin), or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of

- size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
3. Elastomeric Tubing Sealant Backings:
 - a. Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 degrees F. Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and to otherwise contribute to optimum sealant performance.
 4. Bond-Breaker Tape:
 - a. Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.
- B. Miscellaneous Materials:
1. Primer:
 - a. Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
 2. Cleaners for Nonporous Surfaces:
 - a. Chemical cleaners acceptable to manufacturers of sealants and sealant-backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
 3. Masking Tape:
 - a. Non-staining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.
 4. Natural Sand:
 - a. Washed natural sand containing no contaminants that would affect the sealant. Color as approved by the architect for sanded joints as indicated or scheduled.
- C. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION

- A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION

- A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.
- B. Joint Sanding: Sand sealant joints at brick and sidewalks.
 1. Immediately after tooling and prior to skinning over of sealant, broadcast sand onto surface of sealant.
 2. Retool by rolling a dowel over the joint to achieve sufficient embedment.
 3. Maintain uniform appearance.

3.4 FIELD QUALITY CONTROL

- A. Field quality control to include field adhesion testing, field stain testing, test methods and evaluation of field test results.
- B. Perform all corrections necessary for issuance of warranty.

3.5 CLEANING

- A. Dispose of all waste material in accordance with project's Waste Management Plan.

3.6 PROTECTION

- A. Protect installed work as required by the manufacturer to maintain product performance, design criteria, and warranty.

3.7 SCHEDULE

- A. Sealants for exterior surfaces.

1. (S-1): Exterior joints occurring in paintable surfaces.
2. (S-2): Typical exterior weather-proofing joints including metal to metal, metal to glass and perimeters.
3. (S-3): Concealed sealants in sheet metal flashing, metal work and other joints calling for nonhardening, nonskinning, non-drying, nonmigrating sealant.
4. (S-4): Joints in sidewalks and other concrete paving. Provide sanded joints.
5. (S-5): Used as a secondary sealant behind directly-applied liquid sealant. Use at all joints larger than 3/4 inch in width as a secondary sealant.

- B. Sealants for interior surfaces:

1. (S-6): Typical Interior Sealant: Moving and non-moving Interior wall and ceiling control joints, smoke rated (but not fire rated) partitions.
2. (S-7): Joints between plumbing fixtures and floor and wall surfaces. Joints between kitchen, laundry room and bath countertops and wall surfaces.
3. (S-8): Use for concealed locations only. Sealant bead between top stud runner and structure and between bottom stud track and floor at any wall designated as acoustical.

END OF SECTION

SECTION 08 11 13 - HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Standard hollow metal doors and frames.
- B. Louvers installed in hollow metal doors.
- C. Light frames and glazing installed in hollow metal doors.
- D. Borrowed lite window frames.

1.2 RELATED REQUIREMENTS

- A. 09 90 00 - Painting and Coating: For field painting.
- B. 08 71 00 - Door Hardware
- C. 08 80 00 - Glazing

1.3 SUBMITTALS

- A. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes. Include U-value data for thermally broken doors and frames.
- B. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and identifying location of different finishes, if any.
- C. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.
- D. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- E. Maintenance Data: For user operation and maintenance of system including:
 - 1. Methods for maintaining system's materials and finishes
 - 2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.
- B. Quality Standard: In addition to requirements specified, furnish SDI-Certified manufacturer products that comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".
- C. C.Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to UL10C (neutral pressure at 40" above sill) or UL 10C.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fall in materials or workmanship within specified warranty period.
- B. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Specification is based on Doors and Frames by one of the following:
 - 1. Ceco.
 - 2. Curries.

3. Republic Doors and Frames.
4. Steelcraft.

2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.
- C. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 38 percent.
- D. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

2.3 HOLLOW METAL DOORS

- A. General: Provide 1-3/4 inch doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8 and ANSI/NAAMM HMMA 867.
- B. Exterior Doors (Energy Efficient): Face sheets fabricated of commercial quality hot-dipped zinc coated steel that complies with ASTM A924 A60. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model, ANSI/SDI A250.4 for physical performance level, and HMMA 867 for door construction.
 1. Design: Flush panel.
 2. Core Construction: Foamed in place polyurethane and steel stiffened laminated core with no stiffener face welds, in compliance with HMMA 867 "Laminated Core".
 - a. Provide 22 gauge steel stiffeners at 6 inches on-center internally welded at 5" on-center to integral core assembly, foamed in place polyurethane core chemically bonded to all interior surfaces. No stiffener face welding is permitted.
 - b. Thermal properties to rate at a fully operable minimum U-Factor 0.37 and R-Value 2.7, including insulated door, thermal-break frame and threshold.
 - c. Kerf Type Frames: Thermal properties to rate at a fully operable minimum U-Factor 0.38 and R-Value 2.6, including insulated door, kerf type frame, and threshold.
 3. Level/Model: Level 3 and Physical Performance Level A (Extra Heavy Duty), Minimum 16 gauge (0.053 inch - 1.3-mm) thick steel, Model 2.
 4. Vertical Edges: Vertical edges to be mechanically interlocked with hairline seam. Beveled Lock Edge, 1/8 inch in 2 inches (3 mm in 50 mm).
 5. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet. Doors with an inverted top channel to include a steel closure channel, screw attached, with the web of the channel flush with the face sheets of the door. Plastic or composite channel fillers are not acceptable.
 6. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9".
 7. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.
- C. Interior Doors: Face sheets fabricated of commercial quality cold rolled steel that complies with ASTM A 1008/A 1008M. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:

1. Design: Flush panel. a. Fire Door Core: As required to provide fire-protection and temperature-rise ratings indicated.
2. Level/Model: Level 3 and Physical Performance Level A (Extra Heavy Duty), minimum 16 gauge (0.053-inch - 1.3-mm) thick steel, Model 2.
3. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet. 4. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped. 5. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.
4. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.
5. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

2.4 HOLLOW METAL FRAMES

- A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.
- B. Thermal Break Frames: Subject to the same compliance standards and requirements as standard hollow metal frames. Tested for thermal performance in accordance with NFRC 102, and resistance to air infiltration in accordance with NFRC 400. Where indicated provide thermally broken frame profiles available for use in both masonry and drywall construction. Fabricate with 1/16" positive thermal break and integral vinyl weatherstripping.
- C. Exterior Frames: Fabricated of hot-dipped zinc coated steel that complies with ASTM A 653/A 653M, Coating Designation A60.
 1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
 2. Frames: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.
- D. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.
 1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
- E. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.
- F. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

2.5 LOUVERS

- A. Blade Type: Vision proof inverted V or inverted Y.
- B. Metal and Finish: Galvanized steel, 0.040 inch thick, factory primed for paint finish with baked enamel or powder coated finish.

2.6 ACCESSORIES

- A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.
- B. Mineral Fiber Insulation: For filling frame cavities.

2.7 FINISHING

- A. Primer: Rust-inhibiting, complying with ANSI A250.10, door manufacturer's standard.
- B. Field Finish: In accordance with Section 09 90 00 - Painting and Coating.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION

- A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

- B. Coat inside of frames to be installed in masonry, with bituminous coating, prior to installation.
- C. Coat inside of other frames with bituminous coating to a thickness of 1/16 inch.

3.3 INSTALLATION

- A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.
- B. Install in accordance with the requirements of the specified door grade standard and NAAMM HMMA 840.
- C. Install fire rated units in accordance with NFPA 80.
- D. Seal seam at top closures after finish is applied to create a smooth surface without groove or pits.
 - 1. Seal with sealant Per Section 07 90 05 - Joint Sealers.
- E. Pack all frames with insulation.
- F. Coordinate installation of hardware.
- G. Coordinate installation of electrical connections to electrical hardware items.
- H. Touch up damaged factory finishes.

3.4 TOLERANCES

- A. Clearances Between Door and Frame: As specified in ANSI A250.8.
- B. Maximum Diagonal Distortion: 1/16 in measured with straight edge, corner to corner.

3.5 ADJUSTING

- A. Adjust and lubricate hardware for proper operation.
- B. Adjust for smooth and balanced door movement in accordance with manufacturer's instructions.

3.6 CLEANING

- A. Dispose of all waste material in accordance with project's Waste Management Plan.

3.7 PROTECTION

- A. Protect installed work as required by the manufacturer to maintain product performance, design criteria, and warranty.

3.8 SCHEDULE

- A. Refer to Door Schedule on drawings.

END OF SECTION

SECTION 08 15 73 - INTERIOR SLIDING DOORS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fiberglass door panel.
- B. Sliding door hardware.

1.2 RELATED REQUIREMENTS

- A. 08 71 00 - Door Hardware
- B. 10 26 00 - Wall and Corner Protection: For finishes at door opening.

1.3 SUBMITTALS

- A. Qualification Data: For manufacturer.
- B. Product Data: Provide product criteria, characteristics, accessories, jointing and seaming methods, and termination conditions.
- C. Shop Drawings:
 - 1. Indicate frame configuration, anchor types and spacing, location of cutouts for hardware and reinforcement.
 - 2. Indicate door elevations, internal reinforcement, and cutouts, joinery details, and stiffeners.
 - 3. Include blocking required to support door.
 - 4. Door hardware.
- D. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.
- E. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- F. Maintenance Data: For user operation and maintenance of system including:
 - 1. Methods for maintaining system's hardware, operation, materials and finishes.
 - 2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.
 - 3. Recommendations on maintenance schedule.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in the manufacture of work specified in this section with minimum 5 years of experience.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

PART 2 PRODUCTS

2.1 DESCRIPTION

- A. Surface-mounted top-hung sliding fiberglass door.

2.2 MATERIALS

- A. Fiberglass door panel:
 - 1. Flush, smooth panel.
 - 2. Size: as indicated on drawings.
 - 3. Prepped to be field painted.
- B. Sliding door hardware:
 - 1. Hardware group as indicated in drawings. See section 08 71 00 - Door Hardware.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions meet the manufacturer's requirements before starting work, including location of blocking.

3.2 PREPARATION

- A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION

- A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.
- B. Install sliding doors plumb, level, square, and in proper alignment.
- C. Install doors to close against walls without gaps.
- D. Install doors to open and close smoothly.
- E. Anchor sliding doors securely to supports. Blocking is required at full length of top track.

3.4 ADJUSTING

- A. Adjust doors for proper operation in accordance with manufacturer's instructions.
- B. Adjust doors to operate smoothly without binding or banging.
- C. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.
- D. Adjust and lubricate hardware for proper operation.

3.5 CLEANING

- A. Dispose of all waste material in accordance with project's Waste Management Plan.

3.6 PROTECTION

- A. Protect installed work as required by the manufacturer to maintain product performance, design criteria, and warranty.

3.7 SCHEDULE

- A. Refer to Door Schedule on drawings.

END OF SECTION

SECTION 08 33 13 - COILING COUNTER DOORS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Coiling counter doors, manually operated.

1.2 RELATED REQUIREMENTS

- A. 05 50 00 - Metal Fabrications: For support framing and framed opening.
- B. 08 71 00 - Door Hardware.
- C. 11 00 00 - Foodservice Equipment: For custom fabricated stainless steel counter sill.

1.3 SUBMITTALS

- A. Qualification Data: For manufacturer.
- B. Product Data: Provide general construction, component connections and details.
- C. Shop Drawings: Indicate pertinent dimensioning, anchorage methods, hardware locations, and installation details.
- D. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention. Indicate installation sequence and procedures, adjustment and alignment procedures
- E. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- F. Maintenance Data: For user operation and maintenance of system including:
 - 1. Methods for maintaining system's materials and finishes.
 - 2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.
 - 3. Maintenance Data: Indicate lubrication requirements and frequency and periodic adjustments required.
 - 4. Recommendations on maintenance schedule.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in the manufacture of work specified in this section with minimum 5 years of experience.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Overhead Door Corporation, or approved equal.

2.2 COILING COUNTER DOORS

- A. Basis of Design: Overhead Dotor Corporation, 651 Series.
- B. Material: 22 gauge stainless steel curtain with interlocking slats, extruded aluminum guides.
- C. Face-of-wall mounting.
- D. Finish: No. 4 stainless steel.
- E. Operation: manual push up.
- F. Locking: slide bolt locks suitable for use with padlock.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify opening sizes, tolerances and conditions are acceptable.
- B. Examine conditions of substrates, supports, and other conditions under which this work is to be performed.

- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
- C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.
- D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.
- E. Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 07 90 05 - Sealants.
- F. Install perimeter trim and closures.

3.4 ADJUSTING

- A. Test for proper operation and adjust as necessary to provide proper operation without binding or distortion.
- B. Adjust hardware and operating assemblies for smooth and noiseless operation.

3.5 CLEANING

- A. Clean curtain and components using non-abrasive materials and methods recommended by manufacturer.
- B. Remove labels and visible markings.
- C. Touch-up, repair or replace damaged products before Substantial Completion.

3.6 PROTECTION

- A. Protect installed work as required by the manufacturer to maintain product performance, design criteria, and warranty.

3.7 SCHEDULE

- A. Refer to Door Schedule on drawings.

END OF SECTION

SECTION 08 38 00 - TRAFFIC DOORS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Cooler Doors
- B. Hardware and accessories.

1.2 RELATED REQUIREMENTS

- A. 08 71 00 – Door Hardware.

1.3 SUBMITTALS

- A. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
 - 4. Operation and maintenance data.
- B. Shop Drawings: Show fabrication and installation details; include door elevations, head, jamb, and meeting stile details including full or partial gaskets.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.

1.5 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.6 WARRANTY

- A. Manufacturer's standard two-year warranty that products are free of defects in material and workmanship, guaranteeing to replace (exclusive of freight and labor) parts proven defective within two years after date of shipment to purchaser.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Eliason Corporation or approved.

2.2 COOLER DOORS

- A. Basis of Design: Eliason SCG-3, 3/4 inch (19 mm) exterior grade solid wood core; 1 inch (25 mm) total thickness; medium to heavy duty.
 - 1. Facing: Reinforcing metal plates. (Model SCG-3)
 - a. Full Length Panels: 18 gauge (1.27 mm) stainless steel both sides; stainless steel top hinge covers.
 - 2. Gasket: Full perimeter seal.
 - 3. Window Size: 9 inches (229 mm) wide by 14 inches (356 mm) high.
 - 4. Window Molding: Black rubber molding.
 - 5. Glazing: Clear acrylic.

2.3 HARDWARE AND ACCESSORIES

- A. Hinges: Double action swing hinges.
 - 1. Finish: Stainless Steel
- B. See Section 08 71 00 – Door Hardware,

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. Verify jambs plumb and square.

- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Minimum jamb construction of double studded 2 by 4 wood construction or equivalent.
- C. Reinforce hollow metal jambs at hardware locations.
- D. Steel channel jambs are required for heavy duty traffic doors.

3.4 ADJUSTING

- A. Adjust hardware for proper operation.

3.5 CLEANING

- A. Dispose of all waste material in accordance with project's Waste Management Plan.

3.6 PROTECTION

- A. Protect installed work as required by the manufacturer to maintain product performance, design criteria, and warranty.

3.7 SCHEDULE

- A. Refer to Door Schedule on drawings.

END OF SECTION

SECTION 08 71 00 - DOOR HARDWARE

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes:
 - 1. Mechanical and electrified door hardware
- B. Related Sections:
 - 1. Division 08 Sections:
 - a. "Metal Doors and Frames"
 - b. "Interior Sliding Doors"
 - c. "Coiling Counter Doors"
 - d. "Traffic Doors"
 - 2. Division 26 "Electrical" sections for connections to electrical power system, coordination with fire alarm system, and for low-voltage wiring.

1.02 REFERENCES

- A. UL LLC
 - 1. UL 10B - Fire Test of Door Assemblies
 - 2. UL 10C - Positive Pressure Test of Fire Door Assemblies
 - 3. UL 1784 - Air Leakage Tests of Door Assemblies
 - 4. UL 305 - Panic Hardware
- B. DHI - Door and Hardware Institute
 - 1. Sequence and Format for the Hardware Schedule
 - 2. Recommended Locations for Builders Hardware
 - 3. Keying Systems and Nomenclature
 - 4. Installation Guide for Doors and Hardware
- C. NFPA – National Fire Protection Association
 - 1. NFPA 70 – National Electric Code
 - 2. NFPA 80 – 2016 Edition – Standard for Fire Doors and Other Opening Protectives
 - 3. NFPA 101 – Life Safety Code
 - 4. NFPA 105 – Smoke and Draft Control Door Assemblies
 - 5. NFPA 252 – Fire Tests of Door Assemblies
- D. ANSI - American National Standards Institute
 - 1. ANSI A117.1 – 2017 Edition – Accessible and Usable Buildings and Facilities
 - 2. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties
 - 3. ANSI/BHMA A156.28 - Recommended Practices for Keying Systems
 - 4. ANSI/WDMA I.S. 1A - Interior Architectural Wood Flush Doors
 - 5. ANSI/SDI A250.8 - Standard Steel Doors and Frames

1.03 SUBMITTALS

- A. General:
 - 1. Submit in accordance with Conditions of Contract and Division 01 Submittal Procedures.
 - 2. Prior to forwarding submittal:
 - a. Review drawings and Sections from related trades to verify compatibility with specified hardware.

- b. Highlight, encircle, or otherwise specifically identify on submittals: deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.
- B. Action Submittals:
1. Product Data: Submit technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
 2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:
 - a. Wiring Diagrams: For power, signal, and control wiring and including:
 - 1) Details of interface of electrified door hardware and building safety and security systems.
 - 2) Schematic diagram of systems that interface with electrified door hardware.
 - 3) Point-to-point wiring.
 - 4) Risers.
 3. Samples for Verification: If requested by Architect, submit production sample of requested door hardware unit in finish indicated and tagged with full description for coordination with schedule.
 - a. Samples will be returned to supplier. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.
 4. Door Hardware Schedule:
 - a. Submit concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work critical in Project construction schedule.
 - b. Submit under direct supervision of a Door Hardware Institute (DHI) certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule published by DHI.
 - c. Indicate complete designations of each item required for each opening, include:
 - 1) Door Index: door number, heading number, and Architect's hardware set number.
 - 2) Quantity, type, style, function, size, and finish of each hardware item.
 - 3) Name and manufacturer of each item.
 - 4) Fastenings and other pertinent information.
 - 5) Location of each hardware set cross-referenced to indications on Drawings.
 - 6) Explanation of all abbreviations, symbols, and codes contained in schedule.
 - 7) Mounting locations for hardware.
 - 8) Door and frame sizes and materials.
 - 9) Degree of door swing and handing.
 - 10) Operational Description of openings with electrified hardware covering egress, ingress (access), and fire/smoke alarm connections.
 5. Key Schedule:
 - a. After Keying Conference, provide keying schedule that includes levels of keying, explanations of key system's function, key symbols used, and door numbers controlled.

- b. Use ANSI/BHMA A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
 - c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
 - d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
 - e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion. Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
 - f. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.
- C. Informational Submittals:
- 1. Provide Qualification Data for Supplier, Installer and Architectural Hardware Consultant.
 - 2. Provide Product Data:
 - a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
 - b. Include warranties for specified door hardware.
- D. Closeout Submittals:
- 1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:
 - a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
 - b. Catalog pages for each product.
 - c. Final approved hardware schedule edited to reflect conditions as installed.
 - d. Final keying schedule
 - e. Copy of warranties including appropriate reference numbers for manufacturers to identify project.
 - f. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.
- E. Inspection and Testing:
- 1. Submit written reports to the Owner and Authority Having Jurisdiction (AHJ) of the results of functional testing and inspection for:
 - a. Fire door assemblies, in compliance with NFPA 80.
 - b. Required egress door assemblies, in compliance with NFPA 101.
- 1.04 QUALITY ASSURANCE
- A. Qualifications and Responsibilities:
- 1. Supplier: Recognized architectural hardware supplier with a minimum of 5 years documented experience supplying both mechanical and electromechanical door hardware similar in quantity, type, and quality to that indicated for this Project. Supplier to be recognized as a factory direct distributor by the manufacturer of the primary materials with a warehousing facility in the Project's vicinity. Supplier to have on staff, a certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.

2. Installer: Qualified tradesperson skilled in the application of commercial grade hardware with experience installing door hardware similar in quantity, type, and quality as indicated for this Project.
 3. Architectural Hardware Consultant: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:
 - a. For door hardware: DHI certified AHC or DHC.
 - b. Can provide installation and technical data to Architect and other related subcontractors.
 - c. Can inspect and verify components are in working order upon completion of installation.
 - d. Capable of producing wiring diagram and coordinating installation of electrified hardware with Architect and electrical engineers.
 4. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.
- B. Certifications:
1. Fire-Rated Door Openings:
 - a. Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction.
 - b. Provide only items of door hardware that are listed products tested by UL LLC, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.
 2. Smoke and Draft Control Door Assemblies:
 - a. Provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105
 - b. Comply with the maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at tested pressure differential of 0.3-inch wg (75 Pa) of water.
 3. Electrified Door Hardware
 - a. Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.
 4. Accessibility Requirements:
 - a. Comply with governing accessibility regulations cited in "REFERENCES" article 087100, 1.02.D3 herein for door hardware on doors in an accessible route. This project must comply with all Federal Americans with Disability Act regulations and all Local Accessibility Regulations.
- C. Pre-Installation Meetings
1. Keying Conference
 - a. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
 - 1) Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
 - 2) Preliminary key system schematic diagram.
 - 3) Requirements for key control system.
 - 4) Requirements for access control.
 - 5) Address for delivery of keys.

2. Pre-installation Conference
 - a. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - b. Inspect and discuss preparatory work performed by other trades.
 - c. Inspect and discuss electrical roughing-in for electrified door hardware.
 - d. Review sequence of operation for each type of electrified door hardware.
 - e. Review required testing, inspecting, and certifying procedures.
 - f. Review questions or concerns related to proper installation and adjustment of door hardware.
 3. Electrified Hardware Coordination Conference:
 - a. Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.
- 1.05 DELIVERY, STORAGE, AND HANDLING
- A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site. Promptly replace products damaged during shipping.
 - B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package. Deliver each article of hardware in manufacturer's original packaging.
 - C. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
 - D. Provide secure lock-up for door hardware delivered to Project. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.
 - E. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.
 - F. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.
- 1.06 COORDINATION
- A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.
 - B. Installation Templates: Distribute for doors, frames, and other work specified to be factory or shop prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
 - C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.
 - D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.
- 1.07 WARRANTY
- A. Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within published warranty period.
 1. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.
 2. Warranty Period: Beginning from date of Substantial Completion, for durations indicated in manufacturer's published listings.
 - a. Mechanical Warranty
 - 1) Locks

- a) Schlage L Series: 3 years
- b) Schlage ND Series: 10 years
- c) Schlage ALX Series: 10 years
- 2) Exit Devices
 - a) Falcon: 10 years
- 3) Closers
 - a) LCN 4050 Series: 25 years
 - b) LCN 1450 Series: 25 years
- b. Electrical Warranty
 - 1) Locks
 - a) Schlage: 1 year

1.08 MAINTENANCE

- A. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.
- B. Turn over unused materials to Owner for maintenance purposes.

PART 2 PRODUCTS

1.09 MANUFACTURERS

- A. Approval of manufacturers and/or products other than those listed as "Scheduled Manufacturer" in the individual article for the product category shall be in accordance with QUALITY ASSURANCE article, herein. Submit substitution requests per section 01 25 00 – Substitution Procedures. Approval of substitution is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.
- B. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

1.10 MATERIALS

- A. Fabrication
 - 1. Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. provide screws according to manufacturer's recognized installation standards for application intended.
 - 2. Finish exposed screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
 - 3. Provide concealed fasteners wherever possible for hardware units exposed when door is closed. Coordinate with "Metal Doors and Frames", "Flush Wood Doors", "Stile and Rail Wood Doors" to ensure proper reinforcements. Advise the Architect where visible fasteners, such as thru bolts, are required.
- B. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.
 - 1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.
- C. Cable and Connectors:
 - 1. Where scheduled in the hardware sets, provide each item of electrified hardware and wire harnesses with number and gage of wires enough to accommodate electric function of specified hardware.
 - 2. Provide Molex connectors that plug directly into connectors from harnesses, electric locking and power transfer devices.

3. Provide through-door wire harness for each electrified locking device installed in a door and wire harness for each electrified hinge, electrified continuous hinge, electrified pivot, and electric power transfer for connection to power supplies.

1.11 HINGES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
 - a. Ives 5BB series

B. Requirements:

1. Provide hinges conforming to ANSI/BHMA A156.1.
2. Provide five knuckle, ball bearing hinges.
3. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:
 - a. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
 - b. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high
4. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:
 - a. Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
 - b. Interior: Heavy weight, steel, 5 inches (127 mm) high
5. 2 inches or thicker doors:
 - a. Exterior: Heavy weight, bronze or stainless steel, 5 inches (127 mm) high
 - b. Interior: Heavy weight, steel, 5 inches (127 mm) high
6. Adjust hinge width for door, frame, and wall conditions to allow proper degree of opening.
7. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.
8. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
 - a. Steel Hinges: Steel pins
 - b. Non-Ferrous Hinges: Stainless steel pins
 - c. Out-Swinging Exterior Doors: Non-removable pins
 - d. Out-Swinging Interior Lockable Doors: Non-removable pins
 - e. Interior Non-lockable Doors: Non-rising pins
9. Provide hinges with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware. Locate electric hinge at second hinge from bottom or nearest to electrified locking component. Provide mortar guard for each electrified hinge specified.

1.12 CONTINUOUS HINGES

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Ives

B. Requirements:

1. Provide aluminum geared continuous hinges conforming to ANSI/BHMA A156.26, Grade 1.
2. Provide aluminum geared continuous hinges, where specified in the hardware sets, fabricated from 6063-T6 aluminum.
3. Provide split nylon bearings at each hinge knuckle for quiet, smooth, self-lubricating operation.
4. Provide hinges capable of supporting door weights up to 450 pounds, and successfully tested for 1,500,000 cycles.
5. On fire-rated doors, provide aluminum geared continuous hinges classified for use on rated doors by testing agency acceptable to authority having jurisdiction.

6. Provide aluminum geared continuous hinges with electrified option scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
 7. Provide hinges 1 inch (25 mm) shorter in length than nominal height of door, unless otherwise noted or door details require shorter length and with symmetrical hole pattern.
- 1.13 FLUSH BOLTS
- A. Manufacturers:
 1. Scheduled Manufacturer:
 - a. Ives
 - B. Requirements:
 1. Provide automatic, constant latching, and manual flush bolts with forged bronze or stainless-steel face plates, extruded brass levers, and with wrought brass guides and strikes. Provide 12 inch (305 mm) steel or brass rods at doors up to 90 inches (2286 mm) in height. For doors over 90 inches (2286 mm) in height increase top rods by 6 inches (152 mm) for each additional 6 inches (152 mm) of door height. Provide dust-proof strikes at each bottom flush bolt.
- 1.14 MORTISE LOCKS
- A. Manufacturers and Products:
 1. Scheduled Manufacturer and Product:
 - a. Schlage L9000 series
 - B. Requirements:
 1. Provide mortise locks conforming to ANSI/BHMA A156.13 Series 1000, Grade 1, and UL Listed for 3-hour fire doors.
 2. Indicators: Where specified, provide indicator window measuring a minimum 2-inch x 1/2 inch with 180-degree visibility. Provide messages color-coded with full text and/or symbols, as scheduled, for easy visibility.
 3. Provide locks manufactured from heavy gauge steel, containing components of steel with a zinc dichromate plating for corrosion resistance.
 4. Provide lock case that is multi-function and field reversible for handing without opening case. Cylinders: Refer to "KEYING" article, herein.
 5. Provide locks with standard 2-3/4 inches (70 mm) backset with full 3/4 inch (19 mm) throw stainless steel mechanical anti-friction latchbolt. Provide deadbolt with full 1-inch (25 mm) throw, constructed of stainless steel.
 6. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim. Provide electrified options as scheduled in the hardware sets. Where scheduled, provide switches and sensors integrated into the locks and latches.
 7. Provide motor based electrified locksets that comply with the following requirements:
 - a. Universal input voltage – single chassis accepts 12 or 24VDC to allow for changes in the field without changing lock chassis.
 - b. Fail Safe/Fail Secure – changing mode between electrically locked (fail safe) and electrically unlocked (fail secure) is field selectable without opening the lock case.
 - c. Low maximum current draw – maximum 0.4 amps to allow for multiple locks on a single power supply.
 - d. Low holding current – maximum 0.01 amps to produce minimal heat, eliminate “hot levers” in electrically locked applications, and to provide reliable operation in wood doors that provide minimal ventilation and air flow.
 - e. Connections – provide quick-connect Molex system standard.

8. Lever Trim: Solid brass, bronze, or stainless steel, cast or forged in design specified, with wrought roses and external lever spring cages. Provide thru-bolted levers with 2-piece spindles.
 - a. Lever Design: SPA
- 1.15 CYLINDRICAL LOCKS – GRADE 1
- A. Manufacturers and Products:
 1. Scheduled Manufacturer and Product:
 - a. Schlage ND series
 - B. Requirements:
 1. Provide cylindrical locks conforming to ANSI/BHMA A156.2 Series 4000, Grade 1, and UL Listed for 3-hour fire doors.
 2. Cylinders: Refer to "KEYING" article, herein.
 3. Provide locks with standard 2-3/4 inches (70 mm) backset, unless noted otherwise, with 1/2-inch latch throw. Provide proper latch throw for UL listing at pairs.
 4. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
 5. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
 6. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
 7. Provide electrified options as scheduled in the hardware sets.
 8. Lever Trim: Solid cast levers without plastic inserts and wrought roses on both sides.
 - a. Lever Design: SPA
- 1.16 CYLINDRICAL LOCKS – GRADE 2
- A. Manufacturers and Products:
 1. Scheduled Manufacturer and Product:
 - a. Schlage ALX series
 - B. Requirements:
 1. Provide cylindrical locks conforming to ANSI/BHMA A156.2 Series 4000, Grade 2, and UL Listed for 3-hour fire doors with a minimum cycle life of 1 million.
 2. Cylinders: Refer to "KEYING" article, herein.
 3. Provide locks with standard 2-3/4 inches (70 mm) backset, unless noted otherwise, with 1/2-inch latch throw. Provide 3/4" latch throw for UL listing at pairs.
 4. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
 5. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
 6. Provide a minimum of 5 points of lever engagement between the cassette spindle and lever shank to prevent lever sag.
 7. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
 8. Plug-n-Play – Provide modular lockset allowing lock functions to be created for 7 typical functions by inserting/installing parts into the exterior of a fully assembled chassis
 9. Reconfigurable Chassis - Provide modular lockset that allows the function to be reconfigured by removing external components from the chassis
 10. Lever Trim: Solid cast levers and wrought roses on both sides.
 - a. Lever Design: SPA
- 1.17 EXIT DEVICES
- A. Manufacturers and Products:
 1. Scheduled Manufacturer and Product:
 - a. Falcon 24/25 series

B. Requirements:

1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1 and UL listed for Panic Exit or Fire Exit Hardware.
2. Cylinders: Refer to "KEYING" article, herein.
3. Provide touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.
4. Touchpad must extend a minimum of one half of door width. No plastic inserts are allowed in touchpads.
5. Provide exit devices with deadlatching feature for security and for future addition of alarm kits and/or other electrified requirements.
6. Provide flush end caps for exit devices.
7. Provide exit devices with manufacturer's approved strikes.
8. Provide exit devices cut to door width and height. Install exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.
9. Mount mechanism case flush on face of doors or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
10. Provide cylinder or hex-key dogging as specified at non fire-rated openings.
11. Removable Mullions: 2 inches (51 mm) x 3 inches (76 mm) steel tube. Where scheduled as keyed removable mullion, provide type that can be removed by use of a keyed cylinder, which is self-locking when re-installed.
12. Provide factory drilled weep holes for exit devices used in full exterior application, highly corrosive areas, and where noted in hardware sets.
13. Provide electrified options as scheduled.
14. Provide exit devices with optional trim designs to match other lever and pull designs used on the project.

1.18 CYLINDERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
 - a. Schlage Everest 29 S

B. Requirements:

1. Provide cylinders/cores compliant with ANSI/BHMA A156.5; latest revision; cylinder face finished to match lockset; manufacturer's series as indicated. Refer to "KEYING" article, herein.
2. Provide cylinders in the below-listed configuration(s), distributed throughout the Project as indicated.
 - a. Conventional Patented Open: cylinder with permanent core with open keyway.
3. Patent Protection: Cylinders/cores requiring use of restricted, patented keys, patent protected.
4. Nickel silver bottom pins.

1.19 KEYING

A. Scheduled System:

1. New factory registered system:
 - a. Provide a factory registered keying system, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

B. Requirements:

1. Construction Keying:

- a. Temporary Construction Cylinder Keying.
 - 1) Provide construction cores that permit voiding construction keys without cylinder removal, furnished in accordance with the following requirements.
 - a) Split Key or Lost Ball Construction Keying System.
 - b) 3 construction control keys, and extractor tools or keys as required to void construction keying.
 - c) 12 construction change (day) keys.
 - 2) Owner or Owner's Representative will void operation of temporary construction keys.
 - b. Replaceable Construction Cores.
 - 1) Provide temporary construction cores replaceable by permanent cores, furnished in accordance with the following requirements.
 - a) 3 construction control keys
 - b) 12 construction change (day) keys.
 - 2) Owner or Owner's Representative will replace temporary construction cores with permanent cores.
2. Permanent Keying:
- a. Provide permanent cylinders/cores keyed by the manufacturer according to the following key system.
 - 1) Master Keying system as directed by the Owner.
 - b. Forward biting list and keys separately from cylinders, by means as directed by Owner. Failure to comply with forwarding requirements will be cause for replacement of cylinders/cores involved at no additional cost to Owner.
 - c. Provide keys with the following features:
 - 1) Material: Nickel silver; minimum thickness of .107-inch (2.3mm)
 - 2) Patent Protection: Keys and blanks protected by one or more utility patent(s).
 - 3) Geographically Exclusive: Where High Security or Security cylinders/cores are indicated, provide nationwide, geographically exclusive key system complying with the following restrictions.
 - d. Identification:
 - 1) Mark permanent cylinders/cores and keys with applicable blind code for identification. Do not provide blind code marks with actual key cuts.
 - 2) Identification stamping provisions must be approved by the Architect and Owner.
 - 3) Stamp cylinders/cores and keys with Owner's unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with "DO NOT DUPLICATE" along with the "PATENTED" or patent number to enforce the patent protection.
 - 4) Failure to comply with stamping requirements will be cause for replacement of keys involved at no additional cost to Owner.
 - 5) Forward permanent cylinders/cores to Owner, separately from keys, by means as directed by Owner.
 - e. Quantity: Furnish in the following quantities.
 - 1) Change (Day) Keys: 3 per cylinder/core.
 - 2) Permanent Control Keys: 3.
 - 3) Master Keys: 6.

1.20 DOOR CLOSERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
 - a. LCN 4050A series
 - B. Requirements:
 1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
 2. Provide door closers with fully hydraulic, full rack and pinion action with cast aluminum cylinder.
 3. Closer Body: 1-1/2-inch (38 mm) diameter with 11/16-inch (17 mm) diameter heat-treated pinion journal and full complement bearings.
 4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and all weather requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
 5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
 6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and back check.
 7. Pressure Relief Valve (PRV) Technology: Not permitted.
 8. Provide stick on templates, special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.
- 1.21 DOOR CLOSERS
- A. Manufacturers and Products:
 1. Scheduled Manufacturer and Product:
 - a. LCN 1450 series
 - B. Requirements:
 1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory.
 2. Provide door closers with fully hydraulic, full rack and pinion action with cast aluminum cylinder.
 3. Closer Body: 1-3/8-inch (35 mm) diameter with 5/8-inch (16 mm) diameter pinion journal diameter heat-treated pinion journal and full complement bearings.
 4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
 5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
 6. Pressure Relief Valve (PRV) Technology: Not permitted.
 7. Provide stick on and special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.
- 1.22 DOOR TRIM
- A. Manufacturers:
 1. Scheduled Manufacturer:
 - a. Ives
 - B. Requirements:
 1. Provide push plates, push bars, pull plates, pulls, and hands-free reversible door pulls with diameter and length as scheduled.

1.23 PROTECTION PLATES

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Ives

B. Requirements:

1. Provide protection plates with a minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Size plates 2 inches (51 mm) less width of door on single doors, pairs of doors with a mullion, and doors with edge guards. Size plates 1 inch (25 mm) less width of door on pairs without a mullion or edge guards.
3. At fire rated doors, provide protection plates over 16 inches high with UL label.

1.24 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS

A. Manufacturers:

1. Scheduled Manufacturers:
 - a. Glynn-Johnson

B. Requirements:

1. Provide overhead stop at any door where conditions do not allow for a wall stop or floor stop presents tripping hazard.
2. Provide friction type at doors without closer and positive type at doors with closer.

1.25 DOOR STOPS AND HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Ives

B. Provide door stops at each door leaf:

1. Provide wall stops wherever possible. Provide concave type where lockset has a push button of thumbturn.
2. Where a wall stop cannot be used, provide universal floor stops.
3. Where wall or floor stop cannot be used, provide overhead stop.
4. Provide roller bumper where doors open into each other and overhead stop cannot be used.

1.26 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Zero International

B. Requirements:

1. Provide thresholds, weather-stripping, and gasketing systems as specified and per architectural details. Match finish of other items.
2. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
3. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.
4. Size thresholds 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width unless otherwise specified in the hardware sets or detailed in the drawings.

1.27 FINISHES

A. FINISH: BHMA 626/652 (US26D); EXCEPT:

1. Hinges at Exterior Doors: BHMA 630 (US32D)
2. Aluminum Geared Continuous Hinges: BHMA 628 (US28)
3. Push Plates, Pulls, and Push Bars: BHMA 630 (US32D)
4. Protection Plates: BHMA 630 (US32D)
5. Overhead Stops and Holders: BHMA 630 (US32D)
6. Door Closers: Powder Coat to Match
7. Wall Stops: BHMA 630 (US32D)
8. Latch Protectors: BHMA 630 (US32D)
9. Weatherstripping: Clear Anodized Aluminum
10. Thresholds: Mill Finish Aluminum

PART 3 EXECUTION

1.28 EXAMINATION

- A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance. Verify doors, frames, and walls have been properly reinforced for hardware installation.
- B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- C. Submit a list of deficiencies in writing and proceed with installation only after unsatisfactory conditions have been corrected.

1.29 INSTALLATION

- A. Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.
 1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
 2. Custom Steel Doors and Frames: HMMA 831.
 3. Interior Architectural Wood Flush Doors: ANSI/WDMA I.S. 1A
 4. Installation Guide for Doors and Hardware: DHI TDH-007-20
- B. Install door hardware in accordance with NFPA 80, NFPA 101 and provide post-install inspection, testing as specified in section 1.03.E unless otherwise required to comply with governing regulations.
- C. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.
- D. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.
- E. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.
- F. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- G. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.
- H. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated.
- I. Lock Cylinders:
 1. Install construction cores to secure building and areas during construction period.
 2. Replace construction cores with permanent cores as indicated in keying section.
 3. Furnish permanent cores to Owner for installation.

- J. Wiring: Coordinate with Division 26, ELECTRICAL and Division 28 ELECTRONIC SAFETY AND SECURITY sections for:
 - 1. Conduit, junction boxes and wire pulls.
 - 2. Connections to and from power supplies to electrified hardware.
 - 3. Connections to fire/smoke alarm system and smoke evacuation system.
 - 4. Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.
 - 5. Connections to panel interface modules, controllers, and gateways.
 - 6. Testing and labeling wires with Architect's opening number.
 - K. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.
 - L. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Mount closers so they are not visible in corridors, lobbies and other public spaces unless approved by Architect.
 - M. Closer/holders: Mount closer/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.
 - N. Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room, or alternate location as directed by Architect.
 - O. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
 - P. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.
 - Q. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
 - R. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
 - S. Door Bottoms and Sweeps: Apply to bottom of door, forming seal with threshold when door is closed.
- 1.30 ADJUSTING
- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
 - 1. Spring Hinges: Adjust to achieve positive latching when door can close freely from an open position of 30 degrees.
 - 2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
 - 3. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
 - B. Occupancy Adjustment: Approximately three to six months after date of Substantial Completion, examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors and door hardware.
- 1.31 CLEANING AND PROTECTION
- A. Clean adjacent surfaces soiled by door hardware installation.
 - B. Clean operating items per manufacturer's instructions to restore proper function and finish.
 - C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.
- 1.32 DOOR HARDWARE SCHEDULE

- A. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.
- B. Discrepancies, conflicting hardware, and missing items are to be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application.
- C. Hardware items are referenced in the following hardware schedule. Refer to the above specifications for special features, options, cylinders/keying, and other requirements.
- D. Hardware Sets:

HW SET # 01

Openings

103

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	ENTRANCE/OFFICE LOCK	ALX50T SPA	626	SCH
1	EA	FSIC CORE	23-030 EV29 S	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	DOOR BOTTOM	369AA	AA	ZER

HW SET # 02

Openings
 104

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	STOREROOM W/DEADBOLT	L9480T 17A 09-544	626	SCH
1	EA	FSIC CORE	23-030 EV29 S	626	SCH
2	EA	SURFACE CLOSER	4050A DEL SHCUSH	689	LCN
1	EA	RAIN DRIP	11A	A	ZER
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	MULLION SEAL	8780NBK PSA	BK	ZER
1	EA	ASTRAGAL	43SP	SP	ZER
2	EA	DOOR SWEEP	8198AA	AA	ZER
1	EA	THRESHOLD	65A-223	A	ZER

REPLACE HARDWARE AS NEEDED WITH ABOVE
 AS WILL FIT EXISTING FRAME HARDWARE PREPS

HW SET # 03

Openings
 106

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	PRIVACY W/INDICATOR	L9056T 17A L583-363 L283-722	630	SCH
1	EA	FSIC CORE	23-030 EV29 S	626	SCH
1	EA	SURFACE CLOSER	4050AT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	DOOR BOTTOM	369AA	AA	ZER

HW SET # 04

Openings
 112A

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	PANIC HARDWARE	LD-25-R-EO	630	FAL
1	EA	SURFACE CLOSER	1450 SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	11A	A	ZER
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	DOOR SWEEP	8198AA	AA	ZER
1	EA	THRESHOLD	65A-223	A	ZER

REPLACE HARDWARE AS NEEDED WITH ABOVE
 AS WILL FIT EXISTING FRAME HARDWARE PREPS

HW SET # 05

Openings
 112B

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	FIRE RATED REMOVABLE MULLION	KRF4023	689	FAL
1	EA	FIRE EXIT HARDWARE	F-25-R-EO	630	FAL
1	EA	FIRE EXIT HARDWARE	F-25-R-NL	630	FAL
1	EA	MULLION STORAGE KIT	MT54	689	VON
2	EA	MORTISE CYLINDER	20-061 ICX 36-083	626	SCH
2	EA	FSIC CORE	23-030 EV29 S	626	SCH
2	EA	SURFACE CLOSER	1450 SCUSH	689	LCN
3	EA	GASKETING	488SBK PSA	BK	ZER
2	EA	MULLION SEAL	8780NBK PSA	BK	ZER
2	EA	DOOR SWEEP	8192AA	AA	ZER

HW SET # 06

Openings

115A 115B

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	MORTISE CYLINDER	20-061 ICX 36-083	626	SCH
1	EA	FSIC CORE	23-030 EV29 S	626	SCH

ALL HARDWARE BY DOOR MFG
 VERIFY CYLINDER TYPE REQUIRED

HW SET # 07

Openings

115C 115D 115E

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	PADLOCK L/CYL-FSIC	KS43F3200	606	SCH
1	EA	FSIC CORE	23-030 EV29 S	626	SCH

ALL HARDWARE BY DOOR MFG

HW SET # 08

Openings

117A

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONT. HINGE	224XY	628	IVE
1	EA	PANIC HARDWARE	CD-25-C-EO	630	FAL
1	EA	PANIC HARDWARE	CD-25-C-NL	630	FAL
1	EA	MULLION STORAGE KIT	MT54	689	VON
3	EA	MORTISE CYLINDER	20-061 ICX 36-083	626	SCH
3	EA	FSIC CORE	23-030 EV29 S	626	SCH
2	EA	SURFACE CLOSER	4050A DEL SHCUSH	689	LCN
2	EA	ARMOR PLATE	8400 30" X 2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	11A	A	ZER
1	SET	MEETING STILE	328AA-S	AA	ZER
3	EA	GASKETING	488SBK PSA	BK	ZER
2	EA	DOOR SWEEP	8198AA	AA	ZER
1	EA	THRESHOLD	65A-223	A	ZER

HW SET # 09

Openings

116A 120 123

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	STOREROOM LOCK	ND80TD SPA	626	SCH
1	EA	FSIC CORE	23-030 EV29 S	626	SCH
2	EA	OH STOP & HOLDER	90H	630	GLY
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	MULLION SEAL	8780NBK PSA	BK	ZER
1	EA	ASTRAGAL	43SP	SP	ZER

HW SET # 10

Openings

124A

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	ND80TD SPA	626	SCH
1	EA	FSIC CORE	23-030 EV29 S	626	SCH
1	EA	OH STOP & HOLDER	90H	630	GLY
1	EA	SURFACE CLOSER	1450 REG OR PA AS REQ FC	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	DOOR BOTTOM	369AA	AA	ZER

HW SET # 11

Openings

124B

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	PASSAGE SET	ND10S SPA	626	SCH
1	EA	OH STOP	90S	630	GLY
1	EA	SURFACE CLOSER	1450 DEL REG OR PA AS REQ FC	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

HW SET # 12

Openings

126 127

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	CLASSROOM DEAD LOCK	L463T	630	SCH
1	EA	FSIC CORE	23-030 EV29 S	626	SCH
1	EA	PUSH PLATE	8200 8" X 16"	630	IVE
1	EA	PULL PLATE	8303 10" 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4050A DEL EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	GASKETING	488SBK PSA	BK	ZER

HW SET # 13

Openings

128 203A

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	PRIVACY W/INDICATOR	L9056T 17A L583-363 L283-722	630	SCH
2	EA	FSIC CORE	23-030 EV29 S	626	SCH
1	EA	SURFACE CLOSER	1450 DEL REG OR PA AS REQ FC	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	DOOR BOTTOM	369AA	AA	ZER

HW SET # 14

Openings
129A

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONT. HINGE	224XY	628	IVE
1	EA	PUSH PLATE	8200 8" X 16"	630	IVE
1	EA	PULL PLATE	8303 10" 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4050A DEL SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
3	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	DOOR BOTTOM	369AA	AA	ZER
1	EA	THRESHOLD	545A-223	A	ZER

HW SET # 15

Openings
125

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	ND80TD SPA	626	SCH
1	EA	SGL CYL DEADBOLT	B560T	626	SCH
2	EA	FSIC CORE	23-030 EV29 S	626	SCH
1	EA	OH STOP & HOLDER	90H	630	GLY
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

HW SET # 16

Openings
 201

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	224XY EPT	628	IVE
1	EA	VANDL EU STOREROOM	ND96TDEU SPA RX CON 12V/24V DC	626	SCH
1	EA	FSIC CORE	23-030 EV29 S	626	SCH
1	EA	ELECTRIC STRIKE	6400 FSE 12/24 VAC/VDC	630	VON
1	EA	SURFACE CLOSER	4050A DEL SCUSH	689	LCN
1	EA	SURF. AUTO OPERATOR	6440	AL	LCN
2	EA	ACTUATOR PKG	8310-3857TW	630	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	11A	A	ZER
3	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	DOOR SWEEP	8198AA	AA	ZER
1	EA	THRESHOLD	65A-223	A	ZER
1	EA	WIRE HARNESS	CON-192 VERIFY LENGTH		SCH
1	EA	WIRE HARNESS	CON-6W		SCH
1			ACCESS CONTROL BY OTHERS		
1			POWER SUPPLY BY OTHERS		

OPERATION: ACCESS CONTROL OR TIME CLOCK WILL UNLOCK OUTSIDE LEVER
 AND ACTIVATE OUTSIDE ACTUATOR AND ELECTRIC STRIKE.

HW SET # 17

Openings

119 121 122

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	ND80TD SPA	626	SCH
1	EA	FSIC CORE	23-030 EV29 S	626	SCH
1	EA	OH STOP	90S	630	GLY
1	EA	GASKETING	488SBK PSA	BK	ZER

HW SET # 18

Openings
 S1

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	STOREROOM LOCK	ND80TD SPA	626	SCH
1	EA	FSIC CORE	23-030 EV29 S	626	SCH

ALL OTHER HARDWARE EXISTING

HW SET # 19

Openings
 117B

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONT. HINGE	224XY EPT	628	IVE
1	EA	REMOVABLE MULLION	KR4023	SP28	FAL
1	EA	ELEC PANIC HARDWARE	LD-RX-25-R-EO	630	FAL
1	EA	ELEC PANIC HARDWARE	RX-MEL-25-R-NL 24 VDC	630	FAL
1	EA	MULLION STORAGE KIT	MT54	689	VON
2	EA	MORTISE CYLINDER	20-061 ICX 36-083	626	SCH
2	EA	FSIC CORE	23-030 EV29 S	626	SCH
1	EA	SURFACE CLOSER	4050A DEL SHCUSH	689	LCN
1	EA	SURF. AUTO OPERATOR	6440	AL	LCN
2	EA	ACTUATOR PKG	8310-3857TW	630	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	11A	A	ZER
3	EA	GASKETING	488SBK PSA	BK	ZER
2	EA	MULLION SEAL	8780NBK PSA	BK	ZER
2	EA	DOOR SWEEP	8198AA	AA	ZER
1	EA	THRESHOLD	65A-223	A	ZER
2	EA	WIRE HARNESS	CON-192 VERIFY LENGTH		SCH
2	EA	WIRE HARNESS	CON-6W		SCH
1	EA	KEY SWITCH	653-15 L2 ATS 12/24 VDC	630	SCE
1	EA	POWER SUPPLY	PS902 900-2RS 120/240 VAC		VON

OPERATION: ACCESS CONTROL OR KEY SWITCH TO RETRACT
 PANIC LATCH AND ACTIVATE OUTSIDE ACTUATOR

HW SET # 20

Openings
203B

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	INSTITUTION W/DB	L9482T 17A XL11-543	630	SCH
2	EA	FSIC CORE	23-030 EV29 S	626	SCH
1	EA	SURFACE CLOSER	1450 DEL REG OR PA AS REQ FC	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	OUTSIDE INDICATOR	L283-414	626	SCH

OPERATION KEY IN EITHER LEVER RETRACTS LATCHBOLT

HW SET # 21

Openings
204A

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	ND80TD SPA	626	SCH
1	EA	FSIC CORE	23-030 EV29 S	626	SCH
1	EA	SURFACE CLOSER	1450 SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

HW SET # 22

Openings

105A 105C

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	CLASSROOM DEAD LOCK	L463T	630	SCH
1	EA	FSIC CORE	23-030 EV29 S	626	SCH
1	EA	PUSH PLATE	8200 8" X 16"	630	IVE
1	EA	PULL PLATE	8303 10" 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4050A DEL SHCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	DOOR BOTTOM	369AA	AA	ZER

HW SET # 23

Openings

105B

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	Sliding Door Hdwr	280C-SWT	AA	PEM
1	EA	SLIDING DOOR LOCK	2331	626	ADA
2	EA	MORTISE CYLINDER	20-061 ICX 36-083	626	SCH
2	EA	FSIC CORE	23-030 EV29 S	626	SCH
1	EA	BARN DOOR STRIKE	9100BSTK	630	ACC
1	EA	PULL PLATE	8303 10" 4" X 16"	630	IVE

HW SET # 24

Openings
 114

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	224XY EPT	628	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	EL MORTISE LOCK	L9095TEL 17A RX CON 12/24 VDC	630	SCH
2	EA	FSIC CORE	23-030 EV29 S	626	SCH
1	EA	SURFACE CLOSER	4050A DEL SHCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
3	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	DOOR BOTTOM	369AA	AA	ZER
1	EA	THRESHOLD	545A-223	A	ZER
1	EA	WIRE HARNESS	CON-192 VERIFY LENGTH		SCH
1	EA	WIRE HARNESS	CON-6W		SCH
1	EA	KEY SWITCH	653-15 L2 ATS 12/24 VDC	630	SCE
1	EA	POWER SUPPLY	PS902 900-2RS-FA 120/240 VAC		VON

OPERATION: BOTH LEVERS LOCKED BY KEYSWITCH
 AND RELEASE ON FIRE ALAARM SIGNAL OR LOSS OF POWER.

HW SET # 25

Openings
 101

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
2	EA	FIRE EXIT HARDWARE	F-25-V-L-BE-LBR-QUA	630	FAL
2	EA	SURFACE CLOSER	4050AT	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
2	EA	MAGNET	SEM7850 12V/24V/120V	689	LCN
2	SET	MEETING STILE	328AA-S	AA	ZER
3	EA	GASKETING	488SBK PSA	BK	ZER

HW SET # 26

Openings

102 107A

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM W/DEADBOLT	L9480T 17A 09-544	626	SCH
1	EA	FSIC CORE	23-030 EV29 S	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	DOOR BOTTOM	369AA	AA	ZER
1	EA	INSWING LATCH PROTECTOR	ILP 212	SLB	DON

HW SET # 27

Openings

107B

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM W/DEADBOLT	L9480T 17A 09-544	626	SCH
1	EA	FSIC CORE	23-030 EV29 S	626	SCH
1	EA	OH STOP	90S	630	GLY
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	DOOR BOTTOM	369AA	AA	ZER
1	EA	INSWING LATCH PROTECTOR	ILP 212	SLB	DON

HW SET # 28

Openings
 108

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	ENTRANCE/OFFICE LOCK	ALX50T SPA	626	SCH
1	EA	FSIC CORE	23-030 EV29 S	626	SCH
1	EA	SURFACE CLOSER	4050AT	689	LCN
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	DOOR BOTTOM	369AA	AA	ZER

HW SET # 29

Openings
 109 110

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	ENTRANCE/OFFICE LOCK	ALX50T SPA	626	SCH
1	EA	FSIC CORE	23-030 EV29 S	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

REUSE ALL OTHER HARDWARE

HW SET # 30

Openings
 113

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	PASSAGE SET	L9010 17A	630	SCH
1	EA	SURFACE CLOSER	4050AT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	DOOR BOTTOM	369AA	AA	ZER

HW SET # 31

Openings
 116B

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	STOREROOM W/DEADBOLT	L9480T 17A 09-544	626	SCH
1	EA	FSIC CORE	23-030 EV29 S	626	SCH
2	EA	OH STOP & HOLDER	90H	630	GLY
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	MULLION SEAL	8780NBK PSA	BK	ZER
1	EA	ASTRAGAL	43SP	SP	ZER

HW SET # 32

Openings
 129B

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONT. HINGE	224XY	628	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC PANIC HARDWARE	LD-RX-25-R-L-QUA	630	FAL
1	EA	MORTISE CYLINDER	20-061 ICX 36-083	626	SCH
1	EA	FSIC CORE	23-030 EV29 S	626	SCH
1	EA	SURFACE CLOSER	4050A DEL SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
3	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	DOOR BOTTOM	369AA	AA	ZER
1	EA	THRESHOLD	545A-223	A	ZER
1	EA	WIRE HARNESS	CON-192 VERIFY LENGTH		SCH
1	EA	WIRE HARNESS	CON-6W		SCH

RX SWITCH FOR NIGHT TIME ALARM BY OTHERS

HW SET # 33

Openings
130

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM W/DEADBOLT	L9480T 17A 09-544	626	SCH
1	EA	FSIC CORE	23-030 EV29 S	626	SCH
1	EA	OH STOP	90S	630	GLY
1	EA	SURFACE CLOSER	4050AT	689	LCN
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	DOOR BOTTOM	369AA	AA	ZER
1	EA	INSWING LATCH PROTECTOR	ILP 212	SLB	DON

HW SET # 34

Openings
202

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080T 17A	630	SCH
1	EA	FSIC CORE	23-030 EV29 S	626	SCH
1	EA	SURFACE CLOSER	4050AT	689	LCN
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	DOOR SWEEP	8192AA	AA	ZER
1	EA	THRESHOLD	545A-223	A	ZER

HW SET # 35

Openings
204B

Each door or doors to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	PASSAGE SET	ND10S SPA	626	SCH

ALL OTHER HARDWARE EXISTING

END OF SECTION

SECTION 08 80 00 - GLAZING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Glazing for metal doors and borrowed light frames.

1.2 RELATED REQUIREMENTS

- A. 08 11 13 - Hollow Metal Doors and Frames: For assembly requiring components from this section.
- B. REFERENCE STANDARDS A. ASTM E2010-01: Standard Test Method for Positive Pressure Fire Tests of Window Assemblies. B. ANSI Z97.1: Standard for Safety Glazing Materials Used in Buildings C. CPSC 16 CFR 1201: Safety Standard for Architectural Glazing Materials D. GANA – Glazing Manual. E. FGMA – Sealant Manual. F. NFPA 80: Fire Doors and Windows. G. NFPA 252 – Fire Tests of Door Assemblies. H. NFPA 257 – Fire Tests of Window Assemblies. I. UL 9 – Fire Tests of Window Assemblies. J. UL 10B – Fire Tests of Door Assemblies. K. UL 10C – Positive Pressure Fire Tests of Door Assemblies.

1.3 SUBMITTALS

- A. Qualification Data: For installer, fabricator and design engineer.
- B. Product Data:
 - 1. Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
 - 2. Glazing Compounds & Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements and identify available colors.
- C. Shop Drawings: For any glazing installed with components from this section alone.
 - 1. Submit shop drawings for glazing installed within other systems in accordance with the system submittal requirements.
- D. Sample: Submit two samples in manufacturer's standard size of glass type units, showing coloration and design.
- E. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.
- F. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

1.5 WARRANTY

- A. Sealed Insulating Glass Units: Provide a ten (10) year warranty to include coverage for seal failure, interpane dusting or misting, including replacement of failed units.

PART 2 - PRODUCTS

2.1 DESCRIPTION

- A. Glazing and accessories installed as monolithic glazing or insulating glazing units within framing systems and support structures specified elsewhere.

2.2 INSULATED GLAZING UNITS

- A. Glazed lites in exterior doors (GL-1)
 - 1. Tempered glass for both outboard and inboard lites.
 - 2. Space between lites filled with argon.
 - 3. Outboard Lite: 1/4 inch thick, minimum.
 - a. Tint: clear.
 - b. Coating: Low=E (solar control type) on #2 surface.

4. Inboard Lite: 1/4 inch thick, minimum.
 - a. Tint: clear.
5. Total Thickness: 1 inch.
6. Thermal Transmittance (U-Value): 0.40 maximum.
7. Visible Light Transmittance (VLT): 0.50 minimum.
8. Solar Heat Gain Coefficient (SHGC): 0.30 maximum.

2.3 GLAZING UNITS

- A. Non-fire rated glazed lites in interior doors and borrowed light frames (GL-2).
 1. Tempered glass, 1/4 inch thick, minimum.
 - a. Tint: clear.
- B. Fire-rated glazed lites in fire-rated doors (GL-3).
 1. Tempered glass, 1/4" thick, minimum.
 - a. Tint: clear,.
 2. Provide products listed by ITS (DIR) or UL (DIR) and approved by authorities having jurisdiction.
 3. Safety Glazing Certification L 16 CFR 1201 Category II.
 4. Fire-Rating Period: 45 minutes minimum.
 5. Markings for Fire-Resistance-Rated Glazing Assemblies: Provide permanent markings on fire-resistance-rated glazing in compliance with ICC (IBC), local building code, and authorities having jurisdiction.
 - a. "D" - meets fire door assembly criteria of NFPA 252, UL10B, or UL 10C fire test standards.
 - b. "H" - meets fire door assembly hose stream test of NFPA 252, UL10B, or UL 10C fire test standards.
 - c. "xxx" - placeholder that represents fire-rating period, in minutes.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION

- A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION

- A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.

3.4 PROTECTION

- A. Protect installed work as required by the manufacturer to maintain product performance, design criteria, and warranty.

END OF SECTION

SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

- 1.1 SECTION INCLUDES
 - A. Acoustic Insulation.
 - B. Gypsum Board.
 - C. Resilient Channel.
- 1.2 RELATED REQUIREMENTS
 - A. 06 10 00 - Rough Carpentry: Building framing and sheathing.
 - B. 07 90 05 - Joint Sealers: Acoustic sealant.
- 1.3 SUBMITTALS
 - A. Qualification Data: For Installer and design engineer.
 - B. Product Data: Provide data on gypsum board, glass mat faced gypsum board, accessories, joint finishing system, and cement board.
 - C. Shop Drawings: Indicate special details associated with fireproofing and acoustic seals.
 - D. Test Reports: For all stud framing products that do not comply with ASTM C645 or ASTM C754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.
- 1.4 QUALITY ASSURANCE
 - A. Designer Qualifications: Professional structural engineer with 5 years of documented experience in design of this work and licensed in the location of the project.
 - B. Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years of experience on projects of similar size and complexity.
- 1.5 DELIVERY, STORAGE, AND HANDLING
 - A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

PART 2 PRODUCTS

- 2.1 DESCRIPTION
 - A. Includes Gypsum wallboard finishing, metal trim and accessories, and acoustical sealants and insulation.
- 2.2 PERFORMANCE AND DESIGN CRITERIA
 - A. Provide completed gypsum board assemblies complying with ASTM C840 and GA-216.
 - B. Fire Rated Assemblies: Provide completed assemblies complying with UL listed assemblies indicated and ratings indicated on life safety drawings.
 - 1. Gypsum Association File Numbers: Comply with requirements of GA-600 for the particular assembly.
 - 2. UL Assembly Numbers: Provide construction equivalent to that listed for the particular assembly in the current UL Fire Resistance Directory.
 - C. Interior Partitions Indicated as Acoustic: Provide completed assemblies with the following characteristics:
 - 1. Sound Attenuation Batt Insulation: STC of 45-49 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
- 2.3 MATERIALS
 - A. Gypsum Board:
 - 1. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
 - a. Application: Use for vertical surfaces, unless otherwise indicated.
 - b. Type X: Thickness 5/8 inch.

- 1) Edges: Tapered.
- 2) Products:
 - (a) Georgia-Pacific Gypsum; ToughRock, and ToughRock Fireguard.
 - (b) CertainTeed Gypsum, Inc.; GlasRoc.
- c. Type C: Thickness: As indicated.
 - 1) Edges: Tapered.
 - 2) Products:
 - (a) ToughRock FireGuard C Gypsum Wallboard.
 - (b) CertainTeed Gypsum, Inc.; Type C Fire-Resistant Drywall.
- B. Moisture Resistant Gypsum Board:
 1. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
 - a. Application: Use at locations scheduled below, unless otherwise indicated.
 - b. Type X: Thickness 5/8 inch.
 - c. Edges: Tapered.
 - d. Products:
 - 1) ToughRock Mold-Guard Gypsum Board by Georgia-Pacific Gypsum.
- C. Acoustic Insulation:
 1. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, unfaced. Thickness: 3.5 inches, unless noted otherwise.
- D. Resilient Channel:
 1. Single-leg, 18 mil steel furring channels, 2" x 1/2" deep.
 2. Install perpendicular to framing members with attachment flange along the bottom edge.
 3. Location: as indicated in drawings where STC requirements apply.

2.4 ACCESSORIES

- A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.
- B. Acoustic Sealant:
 1. As specified in Section 07 90 05 - Joint Sealers.
- C. Finishing Accessories:
 1. ASTM C1047, galvanized steel or rolled zinc, unless otherwise indicated.
 - a. Types: As detailed or required for finished appearance.
 - b. Special Shapes: In addition to conventional cornerbead and control joints, provide U-bead at exposed panel edges.
- D. Joint Materials:
 1. ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
 - a. Tape: 2 inch wide, coated glass fiber tape for joints and corners, except as otherwise indicated.
 - b. Typical: Ready-mixed vinyl-based joint compound.
 - c. Exterior Soffits: Chemical hardening type compound.
- E. High Build Drywall Surfacers:
 1. Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish.
- F. Anchorage to Substrate:
 1. Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION

- A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION

- A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.
- B. Comply with ASTM C840 and GA-216. Install to minimize butt end joints, especially in highly visible locations.
- C. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.

3.4 INSTALLATION OF TRIM AND ACCESSORIES

- A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
 - 1. Not more than 30 feet apart on walls and ceilings over 50 feet long.
 - 2. At exterior soffits, not more than 30 feet apart in both directions.
- B. Corner Beads: Install at external corners, using longest practical lengths.
- C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials and as indicated.

3.5 JOINT TREATMENT

- A. Glass Mat Faced Gypsum Board and Exterior Glass Mat Faced Sheathing: Use fiberglass joint tape, bedded and finished with chemical hardening type joint compound.
- B. Paper Faced Gypsum Board: Use paper joint tape, bedded with ready-mixed vinyl-based joint compound and finished with ready-mixed vinyl-based joint compound.
- C. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
 - 1. Level 5: Walls and ceilings typical.
 - 2. Level 4: Perforated gypsum.
 - 3. Level 4: For flat paint, a light final paint texture, or with lightweight wall covering.
 - 4. Level 3: In utility areas, behind cabinetry, and on backing board to receive tile finish.
 - 5. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
 - 6. Level 1: Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction.
 - 7. Level 0: Temporary partitions and surfaces indicated to be finished in later stage of project.
 - 8. Level 0: Surfaces indicated to be finished in later stage of project.
- D. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
 - 1. Feather coats of joint compound so that camber is maximum 1/32 inch.
 - 2. Taping, filling, and sanding is not required at surfaces behind adhesive applied ceramic tile and fixed cabinetry.
- E. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.
- F. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

3.6 FIELD OBSERVATION AT "PUNCH"

- A. Finish will be judged from a viewing difference of 4 feet.
- B. Ceilings will be viewed from a standing position.

- C. Finished lighting system or temporary lighting similar to proposed finished lighting should be used for judging the wall.
- D. Eye catching discrepancies and or blemishes, including “fuzzy” wall board surfaces, will be rejected.

3.7 CLEANING

- A. Dispose of all waste material in accordance with project's Waste Management Plan.

3.8 PROTECTION

- A. Protect installed work as required by the manufacturer to maintain product performance, design criteria and warranty.

3.9 SCHEDULE

- A. Typical: Gypsum Board, Type X, 5/8 thickness.
- B. Moisture-Resistant: Shower rooms, restrooms, kitchen, laundry, pet care, kennels, and walls behind sinks in rooms not listed.

END OF SECTION

SECTION 09 51 00 - ACOUSTICAL CEILINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Suspended metal grid ceiling system.
- B. Acoustical units.
- C. Supplementary acoustical insulation above ceiling.
- D. Bird Control Barrier

1.2 RELATED REQUIREMENTS

- A. 07 90 05 - Joint Sealers: Acoustic sealant.
- B. 09 21 16 - Gypsum Board Assemblies: Acoustical insulation.
- C. Division 23 HVAC
- D. Division 26 Electrical

1.3 SUBMITTALS

- A. Qualification Data: For manufacturer and installer.
- B. Shop Drawings: Indicate grid layout and related dimensioning, junctions with other ceiling finishes, mechanical and electrical items installed in the ceiling, and perimeter molding and suspension/bracing details.
- C. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.
- D. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- E. Maintenance Data: For user operation and maintenance of system including:
 - 1. Methods for maintaining system's materials and finishes.
 - 2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in the manufacture of work specified in this section with minimum 5 years of experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum of 5 years of experience.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

1.6 WARRANTY

- A. Provide 10-year manufacturer warranty on all acoustical panels for sagging and warping, grid system, rusting, and manufacturer's defects.
- B. Provide 15-year warranty for all products using additional "Humidity and Sag resistance" control systems.

PART 2 PRODUCTS

2.1 DESCRIPTION

- A. Suspended metal grid ceiling systems with seismic edge clips and manufactured edge trim at changes in plane. Fiberglass and gypsum based acoustical units.

2.2 PERFORMANCE AND DESIGN CRITERIA

- A. Seismic Requirements:
 - 1. Classification: Conform to ASTM C635/C635M, Heavy Duty Classification.
 - 2. Code Compliance: IBC, American Society of Civil Engineers ASCE 7, and CISCA (AC) Guidelines. Comply with edition dates per local Authorities Having Jurisdiction.

- B. Components: Lock together in a positive manner.
- C. Pull out tension:
 - 1. Cross Tee Connections: Minimum 300 pounds.
 - 2. Main Tee Splices: Minimum 200 pounds.
- D. Seismic Lateral Design: Conform to IBC and ASCE 7 especially requirement for independent support from structure above for light fixture and mechanical services installed into acoustical lay-in panel ceiling systems.
- E. Install to conceal plenum space above acoustical ceiling system and to allow access.
- F. Make provisions for vertical as well as horizontal suspension systems.

2.3 MANUFACTURERS

- A. Source Limitations:
 - 1. Suspended Acoustical Tile Ceilings: Obtain each type of acoustical ceiling tile and its suspension system from single source from single manufacturer.
- B. Subject to compliance with requirements, provide products by the following:
 - 1. Armstrong World Industries, Inc.
 - 2. Certain Teed Corporation
 - 3. USG Corporation
 - 4. Equal approved by Architect

2.4 MATERIALS

- A. (ACT-1) Acoustical Units:
 - 1. Basis of Design: ULTMA High NRC by Armstrong
 - 2. Performance Criteria:
 - a. NRC 0.80 determined in accordance with ASTM E1264
 - b. CAC 35 determined in accordance with ASTM E1264
 - c. Class A, Flame Spread index of 0-25 or less, Smoke Developed Index of 450 or less (UL labeled)
 - d. Light reflectance 87% determined in accordance with ASTM E1264
 - 3. Features:
 - a. Modular Size: 24 x 48 inches
 - b. Thickness: 7/8"
 - c. Edge: Square Lay-in 15/16
 - d. Color: White
 - e. Fine texture, mold-and mildew-resistant surface.
- B. (ACT-2) Acoustical Units - Wet Areas:
 - 1. Basis of Design: KITCHEN ZONE by Armstrong.
 - 2. Performance Criteria:
 - a. CAC 33 determined in accordance with ASTM E1264
 - b. Class A, Flame Spread Index of 0-25 or less, Smoke Developed Index of 450 or less (UL labeled).
 - c. Light reflectance 89% determined in accordance with ASTM E1264.
 - 3. Features:
 - a. Modular Size: 24 x 48 inches.
 - b. Thickness: 5/8" inch.
 - c. Edge: Square Lay-In 15/16.
 - d. Color: White.
 - e. Smooth texture, disinfectable, water-repellent, washable panels typically used in food prep areas.
 - 4. See drawings for sound attenuation batt insulation above ceilings.

- C. Suspension System:
 - 1. Basis of Design: Prelude XL 15/16 by Armstrong.
- 2.5 BIRD CONTROL BARRIER
 - A. Bird Control Netting:
 - 1. Basis of Design: StealthNet Heavy Duty Bird Netting by Global Industrial.
 - a. Size: 25" x 25'
 - b. Thickness: 3/4"
 - c. Color: Black
- 2.6 ACCESSORIES
 - A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.
 - B. Support Channels and Hangers:
 - 1. Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.
 - C. Perimeter Moldings at Changes in Elevation:
 - 1. Same material and finish as grid.
 - a. At Exposed Grid: Provide L-shaped molding for mounting at same elevation as face of grid. Basis of Design: Axiom Trim and Transitions by Armstrong Commercial Ceilings.
 - b. At Concealed Grid: Provide concealed molding.
 - D. Seismic Suspension Edge Clips:
 - 1. Manufacturer's approved, to meet code required movement without 2 inch wall angles.
 - a. Basis of Design: Seismic RX BERC2 clip components by Armstrong or ACM7 seismic clips components by USG.
 - E. Demountable Ceiling Grid Clips:
 - 1. Basis of Design: C1430 variable placement hook clip by Armstrong.
 - F. Acoustical Sealant For Perimeter Moldings:
 - G. Touch-up Paint:
 - 1. Type and color to match acoustical and grid units.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions meet the manufacturer's requirements before starting work.
- B. Verify that layout of hangers will not interfere with other work.

3.2 PREPARATION

- A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION

- A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.
- B. Suspension system:
 - 1. Install suspension system in accordance with ASTM C636/C636M and manufacturer's instructions and as supplemented in this section.
 - 2. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
 - 3. Lay out system to a balanced grid design with edge units no less than 50 percent of acoustical unit size.
 - a. See also reflected ceiling plans. Where 50 percent unit cannot be achieved, consult Architect before installation.

4. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.
5. Provide hanger clips during steel deck erection. Provide additional hangers and inserts as required.
6. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
7. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
8. Do not support components on main runners or cross runners if weight causes excess deflection.
9. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
10. Do not eccentrically load system or induce rotation of runners.
11. Form expansion joints as detailed. Form to accommodate plus or minus 1 inch movement. Maintain visual closure.

3.4 TOLERANCES

- A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.
- B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

3.5 CLEANING

- A. Dispose of all waste material in accordance with project's Waste Management Plan.

3.6 PROTECTION

- A. Protect installed work as required by the manufacturer to maintain product performance, design criteria and warranty.

END OF SECTION

SECTION 09 65 00 - RESILIENT FLOORING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Resilient sheet flooring.
- B. Resilient base.
- C. Resilient installation accessories.

1.2 ADMINISTRATIVE REQUIREMENTS

- A. ASTM F710 - Standard Practice for Preparing Concrete Floors to receive resilient flooring: 2019

1.3 SUBMITTALS

- A. Qualification Data: For installer.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- C. Shop Drawings: Submit shop drawings indicating materials, details, and accessories including but limited to the following:
 - 1. Floor plans indicating seam locations and roll direction.
 - 2. Floor plans including notations at each drainage protrusion (drains, cleanouts, grease traps, and similar items) as to the method of connection.
 - 3. Wall caps and transition to adjacent materials.
- D. Flooring Sample: Submit two samples, 6 x 6 inch in size illustrating color and pattern for each resilient flooring product specified; heat weld rod samples for selection.
- E. Base and Accessory Samples: Submit manufacturer's complete set of color samples for initial selection.
- F. Certificate: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of subfloor is acceptable.
- G. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.
- H. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- I. Maintenance Data: For user operation and maintenance of system including:
 - 1. Methods for maintaining system's materials and finishes.
 - 2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.
 - 3. Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

1.4 MAINTENANCE MATERIAL

- A. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. Extra Flooring Material: 10 square feet of each type and color.
 - 2. Extra Wall Base: 20 linear feet of each type and color.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in the manufacture of work specified in this section with minimum 5 years of experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

1.7 WARRANTY

- A. Provide minimum Manufacturers Limited 5 year commercial warranty for manufacturing defects.

PART 2 PRODUCTS

2.1 DESCRIPTION

- A. Resilient sheet flooring, resilient base and installation accessories for transition to other flooring types.

2.2 PERFORMANCE AND DESIGN CRITERIA

- A. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648 or NFPA 253.

2.3 RESILIENT SHEET FLOORING

A. (RES-2) Vinyl Sheet Flooring:

- 1. Basis of Design: Stronghold 30 by Altro.
- 2. Features:
 - a. Total Thickness: 3 mm minimum.
 - b. Construction: homogenous.
 - c. Static coefficient of friction (ASTM D2047): 0.88 dry, 1.03 wet.
 - d. Pattern: Dolphin-K3010.
- 3. Cove Base: 6".
- 4. Seamless Installation: Heat weld

B. (RES-3) Vinyl Sheet Flooring:

- 1. Basis of Design: Aquarius by Altro
- 2. Features:
 - a. Total Thickness: 2 mm minimum.
 - b. Construction: homogenous.
 - c. Static coefficient of friction (ASTM D2047): 0.88 dry, 1.03 wet.
 - d. Pattern: SEA SNAIL AQI2024
- 3. Cove Base: 6"
- 4. Seamless Installation: Heat weld.

C. (RES-4) Vinyl Sheet Flooring:

- 1. Basis of Design: Performa Urban Ash by Tarkett.
- 2. Features:
 - a. Total Thickness: 2mm minimum.
 - b. Construction: homogenous.
 - c. Static coefficient of friction (ASTM DD207): ≥ 0.5
 - d. Pattern: 55011 NEW MAPLE WB
- 3. Cove Base: N/A
- 4. Seamless Installation: Heat weld.

D. (RES-5) Vinyl Sheet Flooring:

- 1. Basis of Design: Reliance 25 by Altro
- 2. Features: a. Total Thickness: 2mm minimum. b. Construction: homogenous c. Static coefficient of friction (ASTM D2047): >0.8 d. Pattern: STEAM D2518 3. Cove Base: 6" 4. Seamless Installation: Heat weld.
 - a. Total Thickness: 2mm minimum.
 - b. Construction: homogenous
 - c. Static coefficient of friction (ASTM D2047): >0.8
 - d. Pattern: STEAM D2518 3. Cove Base: 6" 4. Seamless Installation: Heat weld.

2.4 RESILIENT BASE

A. (RES-1) Resilient Base: ASTM F1861, top set Style A straight, and as follows:

- 1. Basis of Design: Johnsonite Traditional Vinyl 1/8" by Tarkett
- 2. Type: Thermoset Rubber Base.

3. Thickness: 0.125 inch thick.
4. Material: TS - Thermoset Vulcanized Rubber
5. Finish: Satin.
6. Color: 20 Charcoal
7. Style: 4-inch standard toe base.
8. Length: Roll (4 foot sections are not acceptable except as maintenance stock).

2.5 RESILIENT INSTALLATION ACCESSORIES

A. Rubber Transition:

1. Basis of Design: Johnsonite Finishing Accessories by Tarkett.
2. Profile:
 - a. (TR-1): VDL-SQ
 - b. (TR-2): CTA-HT
 - c. (TR-3): CTA-Y
 - d. (TR-4): RRS-B
3. Color: Charcoal
4. Locations: Provide rubber molding accessories in areas indicated and as recommended by flooring manufacturer for complete installation.

2.6 ACCESSORIES

- A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.
- B. Subfloor Filler:
 1. White premix latex; type recommended by adhesive material manufacturer.
- C. Primers, Adhesives, and Seaming Materials:
 1. Waterproof; types recommended by flooring manufacturer.
- D. Moldings, Transition and Edge Strips:
 1. Same material as flooring.
- E. Filler for Coved Base:
 1. Plastic.
- F. Sealer and Wax:
 1. Types recommended by flooring manufacturer.
 2. Heat Weld Rod
 - a. Color to closely match resilient flooring, as selected by Architect from manufacturer's standard colors.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions meet the manufacturer's requirements before starting work, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified, are dust-free, and are ready to receive resilient base.
- C. Verify that required floor-mounted utilities are in correct location.

3.2 PREPARATION

- A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION

- A. General:
 1. Install all materials in accordance with manufacturer's instructions based on conditions present.
 2. Starting installation constitutes acceptance of subfloor conditions.

3. Fit joints tightly.
 4. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.
 5. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
 - a. Metal Strips: Attach to substrate before installation of flooring using stainless steel screws.
 - b. Resilient Strips: Attach to substrate using adhesive.
 6. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.
 7. Install flooring in recessed floor access covers, maintaining floor pattern.
 8. At movable partitions, install flooring under partitions without interrupting floor pattern.
 9. Turn sheet flooring up 4 inches to create integral cove base. Heat weld corner seams.
 10. Seamless Installation:
 - a. Heat-Welded Seams: Comply with ASTM F1516. Rout joints and heat weld with welding bead to fuse sections permanently into a seamless flooring installation. Prepare, weld, and finish seams to produce surfaces flush with adjoining flooring surfaces.
- 3.4 CLEANING
- A. Dispose of all waste material in accordance with project's Waste Management Plan.
 - B. Remove excess adhesive from floor, base, and wall surfaces without damage.
 - C. Initial cleaning and finishing is the responsibility of the contractor.
 1. Follow manufacturer's recommendations for initial cleaning and finishing procedures.
 2. Not all types of flooring require finishing.
- 3.5 PROTECTION
- A. Protect installed work as required by the manufacturer to maintain product performance, design criteria, and warranty.

END OF SECTION

SECTION 09 68 13 - TILE CARPETING

PART 1 GENERAL

- 1.1 SECTION INCLUDES
 - A. Modular carpet tile.
- 1.2 RELATED REQUIREMENTS
 - A. 09 65 00 - Resilient Flooring: For resilient installation accessories installed with carpet tile.
- 1.3 SUBMITTALS
 - A. Qualification Data: For installer.
 - B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
 - C. Shop Drawings: Indicate layout of joints.
 - D. Flooring Sample: Submit two carpet tiles illustrating color and pattern design for each carpet color selected.
 - E. Accessory Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.
 - F. Certificate: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of sub-floor is acceptable.
 - G. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.
 - H. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
 - I. Maintenance Data: For user operation and maintenance of materials including:
 - 1. Methods for maintaining materials and finishes.
 - 2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.
 - 3. Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.
- 1.4 MAINTENANCE MATERIAL
 - A. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. Extra Flooring Material: 3 percent of each type and color (minimum of 10 yards) each type and color.
- 1.5 QUALITY ASSURANCE
 - A. Installer Qualifications: Company specializing in performing the work of this section with minimum 3 years of experience.
- 1.6 DELIVERY, STORAGE, AND HANDLING
 - A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.
- 1.7 WARRANTY
 - A. Provide minimum Manufacturers Limited 5 year commercial warranty for manufacturing defects.

PART 2 PRODUCTS

- 2.1 DESCRIPTION
 - A. Carpet tile flooring fully adhered.
- 2.2 PERFORMANCE AND DESIGN CRITERIA
 - A. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648 or NFPA 253.
 - B. Surface Flammability Ignition: Pass ASTM D2859 (the "pill test").

2.3 CARPET TILE

- A. (CPT-1) Modular Carpet Tile:
 - 1. Basis of Design: KINETEX CATALYST 1841 by J + J Flooring.
 - 2. Performance Criteria:
 - a. Flooring Radiant Panel: Class 1.
 - b. Smoke Density: less than 450 (flaming & non-flaming).
 - c. Water Repellency: 4.0 or greater, AATCC TM22.
 - d. Noise Reduction Coefficient (NRC): 0.30 minimum.
 - e. Impact Insulation Classification (IIC): 64 minimum.
 - 3. Features:
 - a. Construction: Textile Composite.
 - b. Backing: Polyester Felt Cushion.
 - c. Thickness: 0.205 inches.
 - d. Size: 24 inch x 24 inch modules, Ashlar installation.
 - e. Color: CHEMISTRY 2847

2.4 ACCESSORIES

- A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.
- B. Subfloor Filler: Type recommended by adhesive material manufacturer.
- C. Primers, Adhesives, and Seaming Materials: Waterproof; types recommended by flooring manufacturer.
- D. Moldings, Transition and Edge Strips: 09 65 00 - Resilient Flooring.
- E. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions meet the manufacturer's requirements before starting work, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.
- B. Cementitious Subfloor Surfaces: Verify that substrates meet moisture, internal relative humidity and alkalinity requirements of flooring and adhesive manufacturers.
 - 1. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.
- C. Verify that required floor-mounted utilities are in correct location.

3.2 PREPARATION

- A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION

- A. General:
 - 1. Install all materials in accordance with manufacturer's instructions based on conditions present and CRI Carpet Installation Standard.
 - 2. Blend carpet from different cartons to ensure minimal variation in color match.
 - 3. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.
 - 4. Lay carpet tile in pattern scheduled in Finish Legend on Drawings, with pile direction parallel to next unit, set aligned as indicated on shop drawings.
 - 5. Starting installation constitutes acceptance of subfloor conditions.
 - 6. Fit joints tightly.
 - 7. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

8. Trim carpet tile neatly at walls and around interruptions.
9. Complete installation of edge strips, concealing exposed edges.

3.4 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Clean and vacuum carpet tile surfaces in accordance with manufacturer's instructions.
- C. Dispose of all waste material in accordance with project's Waste Management Plan.

3.5 PROTECTION

- A. Protect installed work as required by the manufacturer to maintain product performance, design criteria, and warranty.

END OF SECTION

SECTION 09 90 00 - PAINTING AND COATING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Interior paint systems.
- B. Exterior paint systems.
- C. Exterior paint systems.
- D. Surface preparation for field applied painting and coating.

1.2 RELATED REQUIREMENTS

- A. 06 10 00 - Rough Carpentry: For painting communications and electrical room mounting boards.
- B. 07 46 46 - Fiber Cement Siding
- C. 008 11 13 - Hollow Metal Doors and Frames
- D. 09 21 16 - Gypsum Board Assemblies: For finish levels required of substrates.

1.3 SUBMITTALS

- A. Product Data: Provide product criteria, characteristics, accessories, jointing and seaming methods, and termination conditions.
- B. Substrate Preparation Plan:
 - 1. Cleaning sample area selection.
 - 2. Preparation and execution including pollution control and safety procedures.
 - 3. Coordination with other Work.
 - 4. Proposed cleaning and restoration methods:
 - a. Submit a descriptive narrative on cleaning and restoration methods to be employed in the Work. Organize description in sequence from preparation through completion of the Work. Include a schedule showing estimated time, in calendar days, for completion of each phase of the Work shall be included.
 - b. Submit the cleaning and restoration methods, tools, and materials selected for each specific material, take into account adjacent materials, assemblies and location of the area to be worked upon when selecting cleaning materials and procedures.
- C. Shop Drawings: Include annotated architectural drawing indicating scope and location of:
 - 1. Existing substrates to be cleaned and painted or coated.
 - 2. Exposed Overhead Work and Open to Structure areas to receive painting or coating.
- D. Sample: Submit two cardstock "draw down" samples, 8.5 x 11 inch in size, including standard and custom paint color formula and availability information, illustrating range of color and texture available for each surface finishing product scheduled.
- E. Matching Finishes:
 - 1. Coordination of matching site- and field-applied coatings required.
- F. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.
- G. Maintenance Data: For user operation and maintenance of system including:
 - 1. Methods for maintaining finishes.
 - 2. Precautions about cleaning materials and methods that could be detrimental to finishes, and performance.
 - 3. Recommendations on maintenance schedule.

1.4 MOCKUP

- A. Paint 5 sq ft swatch mockup of each EP-1 paint option for owner and architect review.
- B. Locate where indicated in drawings.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum ten years documented experience.
- B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum five years experience and approved by manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.
- B. Store, mix, apply and dispose of paint related materials in accordance with requirements of Authorities Having Jurisdiction.

PART 2 PRODUCTS

2.1 DESCRIPTION

- A. Field-applied painting and coatings and substrate preparation.

2.2 MANUFACTURERS

- A. Paints:
 - 1. **B-M:** Benjamin Moore; www.benjaminmoore.com.
 - 2. **S-W:** Sherwin-Williams Co.; www.sherwin-williams.com.
- B. Transparent Coatings:
 - 1. **B-M:** Benjamin Moore; www.benjaminmoore.com.
 - 2. **S-W:** Sherwin-Williams Co.; www.sherwin-williams.com.

2.3 EXTERIOR PAINT SYSTEMS

- A. Exterior Acrylic Latex
 - 1. See schedule for finish and locations.

2.4 ACCESSORIES

- A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin application of paints and finishes until substrates have been properly prepared.
- B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.
- D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- E. Test shop-applied primer for compatibility with subsequent cover materials.
- F. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below manufacturer recommendations.

3.2 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- D. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.
- E. Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried;

sand between coats. Back prime concealed surfaces before installation.

3.3 INSTALLATION

- A. Install all materials in accordance with manufacturer's instructions based on conditions present.
- B. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- C. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.
- D. Sand wood and metal surfaces lightly between coats to achieve required finish.

3.4 PROTECTION

- A. Protect installed work as required by the manufacturer to maintain product performance, design criteria, and warranty.

3.5 SCHEDULE

A. Interior Paint Systems:

- 1. (P-1)
 - a. Finish: Sherwin Williams SW 7005 PURE WHITE, eggshell.
 - b. Location: Walls and ceilings typical.
- 2. (P-2) epoxy
 - a. Finish: match P-1.
 - b. Location: Damp and wet areas.
- 3. (P-3) flame retardant
 - a. Finish: match P-1.
- 4. (P-4)
 - a. Finish: color TBD, eggshell.
 - b. Location: Accent walls.
- 5. (P-5)
 - a. Finish: color match RES-1, semi-gloss.
 - b. Location: Doors, door frames, wood trim.

B. Exterior Paint Systems:

- 1. (EP-1)
 - a. Finish: Color TBD, Sherwin Williams SW 7616 BREEZY or SW6247 KRYPTON
 - b. Location: Siding typical.
- 2. (EP-2)
 - a. Finish: Benjamin Moore 1672 ALFRESCO, semi-gloss.
 - b. Location: Doors, door frames, trim boards.
- 3. (EP-3)
 - a. Finish: Benjamin Moore AF-505 BLUE ECHO, satin.
 - b. Location: Accent siding.
- 4. (EP-4)
 - a. Finish: Sherwin Williams SW 7636 ORIGAMI WHITE, satin.
 - b. Location: Soffit.

END OF SECTION

SECTION 10 14 00 - SIGNAGE

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Interior Room Identification Signs.
- B. Exterior Room Identification Signs.
- C. Parking Signs.
- D. Emergency Evacuation Plan Signs.

1.2 SUBMITTALS

- A. Qualification Data: For fabricator and design engineer.
- B. Product Data: Provide product criteria, characteristics, accessories, jointing and attachment methods.
- C. Shop Drawings:
 - 1. Show sign mounting heights, locations of supplementary supports, and accessories.
 - 2. Provide message list, typestyles, graphic elements, including tactile characters and Braille, and layout for each sign.
 - 3. Wiring Diagrams: Power, signal, and control wiring.
- D. Verification Samples: Submit samples showing colors specified
- E. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.
- F. Maintenance Data: For user operation and maintenance of system including:
 - 1. Methods for maintaining system's materials and finishes.
 - 2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.
 - 3. Include manufacturers' brochures and parts lists describing the actual materials installed.

1.3 MAINTENANCE MATERIAL

- A. Spare parts, extra stock, tools.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualification: Company specializing in the manufacture of work specified in this section with minimum 5 years of experience.
- B. Fabricators Qualifications: Company specializing in performing the work of this section with minimum 5 years of experience on projects of similar size and complexity.
- C. Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years of experience on projects of similar size and complexity.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

PART 2 PRODUCTS

2.1 INTERIOR ROOM IDENTIFICATION SIGNS

- A. Accessibility Compliance: Signs are required to comply with ADA Standards and ICC A117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.
- B. Braille: Grade 2, all signs.
- C. Construction: Acrylic, 1/8 inch thick, radiused corners.
- D. Color: As selected by Architect from manufacturer's standard line of colors. Border and text/pictograms to contrast with background.
- E. Mounting: 1/16" vinyl foam tape on wall surface adjacent doors unless noted otherwise.
- F. Text: As scheduled. Font and size TBD.

- G. Schedule:
1. Gender-specific Shower Rooms
 - a. Rooms: MEN (105M), WOMEN (105W)
 - b. Text: "MEN" or "WOMEN"
 - c. Pictogram: Man or Woman, International Accessibility Symbol, Shower
 2. Family Restrooms
 - a. Rooms: FAMILY RR (106), FAMILY RR (128)
 - b. Text: "ALL GENDER FAMILY RESTROOM"
 - c. Pictogram: Man/Woman, Changing Table, International Accessibility Symbol, Shower
 3. Gender-Specific Restrooms
 - a. Rooms: MEN (127), WOMEN (126)
 - b. Text: "MEN" or "WOMEN"
 - c. Pictogram: Man or Woman, International Accessibility Symbol
 4. All Gender Restrooms
 - a. Rooms: ADA RR (203)
 - b. Text: "ALL GENDER RESTROOM"
 - c. Pictogram: Man/Woman, International Accessibility Symbol, Shower
 5. Max Occupancy Sign
 - a. Rooms: DINING (117)
 - b. Text: "MAXIMUM OCCUPANCY 262 PERSONS"
 - c. Location: Adjacent to Door 114
 6. Electrical
 - a. Rooms: ELEC (112)
 - b. Text: "ELECTRICAL ROOM"
 7. Telecom/Fire Alarm Control Panel Room
 - a. Rooms: TELECOM (1078)
 - b. Text: "TELECOM ROOM", "FIRE ALARM CONTROL PANEL"
- 2.2 EXTERIOR ROOM IDENTIFICATION SIGNS
- A. Construction: opaque vinyl film with pressure-sensitive adhesive backing suitable for both interior and exterior applications.
 - B. Text: As scheduled. Font and size TBD. 1" minimum.
 - C. Schedule:
 1. Electrical
 - a. Rooms: ELEC (112)
 - b. Text: "ELECTRICAL ROOM"
 2. Fire Riser Room
 - a. Rooms: FIRE RISER (104)
 - b. Text: "SPRINKLER RISER ROOM"
- 2.3 PARKING SIGNS
- A. Accessibility Compliance: Signs are required to comply with ADA Standards and ICC A117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.
 - B. Construction: Aluminum Panel Signs.
- 2.4 EMERGENCY EVACUATION PLAN
- A. Evacuation map frame suitable to hold minimum 11" x 17" map insert.
 - B. Mounting: 1/16" vinyl foam tape on wall surface.
 - C. Locations as scheduled or as required by local jurisdictions:
 1. Sleep Rooms (113, 114) for Group I-1

2. Dining (117) for Group A

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION

A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION

A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.

3.4 PROTECTION

A. Protect installed work as required by the manufacturer to maintain product performance, design criteria and warranty.

END OF SECTION

SECTION 10 21 13 - TOILET COMPARTMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Solid surface toilet and shower compartments

1.2 RELATED REQUIREMENTS

- A. 05 50 00 - Metal Fabrications: For concealed steel support members.
- B. 06 10 00 - Rough Carpentry: For blocking and supports.
- C. 10 28 00 - Toilet, Bath and Laundry Accessories: For accessories mounted on compartments.

1.3 REFERENCES

- A. ASTM A 666 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- B. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- C. National Fire Protection Association (NFPA) 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.
- D. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- E. United States EPA (Environmental Protection Agency) Registration - Bactericidal Surfaces Registered with the U.S. EPA to Legally Make Claims that these Materials Kill Infectious Bacteria.

1.4 SUBMITTALS

- A. Qualification Data: For manufacturer and design engineer.
- B. Product Data: Provide data sheets for each product including preparation instructions and recommendations, storage and handling requirements and recommendations, and installation methods.
- C. Shop Drawings: Provide layout drawings and installation details with location and type of hardware required.
- D. Sample:
 - 1. For each finish product specified, two samples representing actual product, color, and patterns.
- E. Maintenance Data: For user operation and maintenance of system including:
 - 1. Methods for maintaining system's materials and finishes.
 - 2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in the manufacture of work specified in this section with minimum 5 years of experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

1.7 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.8 WARRANTY

- A. Manufacturer guarantees its plastic against breakage, corrosion, and delamination under normal conditions for 25 years from the date of receipt by the customer. If materials are found to be defective during that period for reasons listed above, the materials will be replaced free of

charge. Labor not included in warranty.

PART 2 PRODUCTS

2.1 DESCRIPTION

- A. Toilet and Shower Compartment/Partition, Doors, Wall Panels, & Pilasters that are fabricated from Prism™ Solid Surface material bonded to a moisture resistant wood reinforced core. Edges shall be fabricated from a matching solid surface material. All seams and glue lines will be inconspicuous. All doors, panels, and pilasters shall be 1" (25.4mm) finished thickness. Doors, panels, and pilasters shall be assembled into complete compartment system.

2.2 MATERIALS

- A. Prism Solid Surface Toilet Compartments/Partitions:
 - 1. Prism™ Solid Surface sheet shall be 1/4" (6.35mm) thick. Material is a mineral filled, cast - based polyester/acrylic hybrid sheet manufactured in flat panels.
 - 2. Core Material: Core material of 1/2" (13mm) thickness shall be moisture resistant wood reinforced core.
 - 3. Edge and seam adhesives: Seams shall be bonded with methyl methacrylate adhesive matching in pigmentation to the face and edge material. All seam and glue lines will be inconspicuous.
 - 4. Stainless Steel: Stainless steel pilaster shoes and caps and brackets shall be type 304 Stainless Steel with a #4 Satin Finish.
 - 5. Concealed Fasteners: Concealed fasteners shall be zinc plated steel.

2.3 SOLID SURFACE TOILET AND SHOWER PARTITIONS/COMPARTMENTS

- A. Basis of Design: Prism Solid Surface Toilet Compartments/Partitions
- B. Performance Criteria:
 - 1. Configurations: Floor to ceiling mounted pilasters
 - 2. Door, Pilaster, and Panel Thickness: 1/4 inch thick
 - 3. Color/Finish: FROSTED WHITE P9711
- C. Features:
 - 1. Pilaster Shoes: Stainless steel shoes (Standard), 22 gauge, Type #304 stainless steel, #4 Satin finish a. 6" height
 - 2. Full Trim Package: Provide solid surface trim that conceals brackets except hinges, and blocks line of sight at door opening.
 - 3. Brackets: Brackets shall be Type #304 stainless steel with #4 Satin finish hardware.
 - 4. Hinges: Piano Hinge-Cam 71" long (full close), stainless steel – satin finish
 - 5. Latches: Emergency Access Indicator Latch
 - 6. Throw: Throw Latch Pack – ADA compliant latch – stainless steel – satin finish
 - 7. Hooks: Hook-combination bumper, satin stainless steel
 - 8. Pulls: Door Pull 3-1/2" centers - Cast stainless steel

2.4 ACCESSORIES

- A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION

- A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION

- A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.

3.4 ADJUSTING

- A. Adjust and lubricate hardware for proper operation. Set hinges on in-swing doors to hold open approximately 30 degrees from closed position when unlatched. Set hinges on out-swing doors (and entrance swing doors) to return to fully closed position.

3.5 CLEANING

- A. Dispose of all waste material in accordance with project's Waste Management Plan.

3.6 PROTECTION

- A. Protect installed work as required by the manufacturer to maintain product performance, design criteria, and warranty.

END OF SECTION

SECTION 10 22 20 - MODULAR KENNEL PARTITIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Modular interlocking kennel system.

1.2 RELATED REQUIREMENTS

- A. 05 50 00 - Metal Fabrications: For concealed steel support members.
- B. 06 10 00 - Rough Carpentry: For blocking and supports.

1.3 REFERENCES

- A. ASTM A 666 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- B. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- C. National Fire Protection Association (NFPA) 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.
- D. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- E. United States EPA (Environmental Protection Agency) Registration - Bactericidal Surfaces Registered with the U.S. EPA to Legally Make Claims that these Materials Kill Infectious Bacteria.

1.4 SUBMITTALS

- A. Qualification Data: For manufacturer and design engineer.
- B. Product Data: Provide data sheets for each product including preparation instructions and recommendations, storage and handling requirements and recommendations, and installation methods.
- C. Shop Drawings: Provide layout drawings and installation details with location and type of hardware required.
- D. Maintenance Data: For user operation and maintenance of system including:
 - 1. Methods for maintaining system's materials and finishes.
 - 2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in the manufacture of work specified in this section with minimum 5 years of experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

1.7 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.8 WARRANTY

- A. Manufacturer guarantees its plastic against breakage, corrosion, and delamination under normal conditions for 25 years from the date of receipt by the customer. If materials are found to be defective during that period for reasons listed above, the materials will be replaced free of charge. Labor not included in warranty.

PART 2 PRODUCTS

2.1 DESCRIPTION

- A. Doors, panels, screens, and pilasters assembled into complete compartment system, with cutouts and drilled holes to receive hardware as indicated; processed and fabricated in accordance with industry standards.

2.2 MODULAR KENNEL PARTITIONS

- A. Basis of Design: Sani-Kennel by Midmark.
 - 1. Panel Material: FRP, Color: TBD
 - 2. Gate Material: Stainless steel Welded Wire
 - 3. Gate Style: Swing
 - 4. Accessories: Transfer doors

2.3 ACCESSORIES

- A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION

- A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION

- A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.

3.4 ADJUSTING

- A. Adjust and lubricate hardware for proper operation. Set hinges on in-swing doors to hold open approximately 30 degrees from closed position when unlatched. Set hinges on out-swing doors (and entrance swing doors) to return to fully closed position.

3.5 CLEANING

- A. Dispose of all waste material in accordance with project's Waste Management Plan.

3.6 PROTECTION

- A. Protect installed work as required by the manufacturer to maintain product performance, design criteria, and warranty.

END OF SECTION

SECTION 10 26 00 - WALL AND CORNER PROTECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Corner guards.
- B. Sheet wall protection

1.2 SUBMITTALS

- A. Product Data: Provide product criteria, characteristics, accessories, jointing and methods, and termination details for curtains, track and accessories.
- B. Submit two samples representing actual product, color, and pattern for each finish product specified.
- C. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.
- D. Maintenance Data: For user operation and maintenance of system including:
 - 1. Methods for maintaining system's hardware, operation, materials and finishes.
 - 2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.
 - 3. Recommendations on maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in the manufacture of work specified in this section with minimum 5 years of experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum of 5 years of experience.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

1.5 WARRANTY

- A. Installation Warranty: Contractor shall correct defective Work within a 2 year period after Date of Substantial Completion; remove and replace materials concealing waterproofing at no extra cost to Owner.

PART 2 PRODUCTS

2.1 DESCRIPTION

- A. Surface applied wall protection including corner guards, bumper rails, rubstrips, plastic sheet wall protection, fiber reinforced plastic sheet, fiber reinforced plastic laminate, and corridor handrails.

2.2 PERFORMANCE AND DESIGN CRITERIA

- A. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.

2.3 MATERIALS

- A. Corner guards.
 - 1. (WDP-3) Metal Corner Guard
 - a. Basis of Design: F 560SS STAINLESS CORNER GUARD by Marlite
 - b. Color and Finish: Stainless Steel
 - 2. (WDP-4) Vinyl Corner Guard, 90 Degrees
 - a. Basis of Design: 150 High Impact Corner Guard by Inpro Corp.
 - b. Size: 4' x 3"
 - c. Color and Finish: To be determined by Architect.
- B. Wall Guards

1. (WDP-5) Vinyl Corner Guard, 90 Degrees
 - a. Basis of Design: 150D High Impact End Wall Protector by Inpro Corp.
 - b. Size: 4' x 3"
 - c. Color and Finish: To be determined by Architect
 2. (WDP-6) Vinyl Corner Guard, 135 Degrees
 - a. Basis of Design: 130 High Impact Corner Guard
 - b. Size: 4' x 3"
 - c. Color and Finish: To be determined by Architect
- C. Sheet Wall Protection.
1. (SOL-2) Solid Surface Wall Protection
 - a. Basis of Design: Prism Solid Surface Shower Walls by Inpro Corp.
 - b. Size: As indicated in drawings.
 - c. Thickness: 1/2-inch.
 - d. Color and Finish: COLOR: FROSTED WHITE P9711
 2. (WDP-1) Fiber Reinforced Plastic Wall Panels
 - a. Basis of Design:
 - 1) Symmetrix SmartSeam FRP by Marlite.
 - b. Height: As indicated in elevations.
 - c. Thickness: 3/32".
 - d. Mounting: Adhesive.
 - e. Pattern: SUBWAY VERTICAL 4" x 8" TILE f.
 - f. Color and Finish: Color: White with Grey Grout Lines SSA917-G63, Finish: Satin
 3. (WDP-2) Fiber Reinforced Plastic Wall Panels
 - a. Basis of Design: 4'x10' Standard FRP by Marlite
 - b. Height: As indicated in drawings
 - c. Thickness: 3/32" d. Mounting: Adhesive e. Color and Finish: Color: White, Finish: Smooth
 - d. Mounting: Adhesive
 - e. Pattern: STANDARD FRP f.
 - f. Color and Finish: Color: White, Finish: Smooth
- 2.4 ACCESSORIES
- A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions meet the manufacturer's requirements before starting work, including location of blocking.

3.2 PREPARATION

- A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION

- A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.
- B. Install components plumb, level, square, and in proper alignment with drawings.

3.4 ADJUSTING

- A. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.

3.5 CLEANING

- A. Dispose of all waste material in accordance with project's Waste Management Plan.

3.6 PROTECTION

- A. Protect installed work as required by the manufacturer to maintain product performance, design criteria, and warranty.

END OF SECTION

SECTION 10 28 00 - TOILET, BATH AND LAUNDRY ACCESSORIES

PART 1 GENERAL

- 1.1 SECTION INCLUDES
 - A. Toilet Accessories.
 - B. Bath Accessories.
 - C. Laundry Accessories.
- 1.2 RELATED REQUIREMENTS
 - A. 06 10 00 - Rough Carpentry: For wood blocking.
 - B. 10 26 00 - Wall and Corner Protection : Wall and Corner Protection for shower surrounds
 - C. 10 21 13 - Toilet Compartments: For partition materials products from this section are installed in.
- 1.3 SUBMITTALS
 - A. Product Data: Provide data on accessories describing size, finish, details of function, attachment methods.
 - B. Sample: Submit 1 sample of each accessory, illustrating color and finish.
 - C. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.
 - D. Maintenance Data: For user operation and maintenance of system including:
 - 1. Methods for maintaining system's materials and finishes.
 - 2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.
- 1.4 MAINTENANCE MATERIAL
 - A. Keys: Provide 3 keys for accessories to Owner; master key all lockable accessories.
- 1.5 QUALITY ASSURANCE
 - A. Manufacturer Qualifications: Company specializing in performing the work of this section with minimum 5 years of experience.
- 1.6 DELIVERY, STORAGE, AND HANDLING
 - A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

PART 2 PRODUCTS

- 2.1 DESCRIPTION
 - A. Accessories to be installed in toilet, bath, and laundry/janitorial rooms.
- 2.2 PERFORMANCE AND DESIGN CRITERIA
 - A. Comply with ANSI/ICC A117.1, Americans with Disabilities Act (ADA Standards).
 - B. Grab bars, shower seats, and dressing room benches shall be designed to resist a single concentrated load of 250 pounds applied in any direction, at any point on the grab bar or seat so as to produce the maximum loading effects, in accordance with ICC (IBC)-2018 Section 1607.8.2.
 - C. Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
- 2.3 TOILET ACCESSORIES
 - A. See drawings for owner furnished, contractor Installed items.
 - B. Mirrors
 - 1. (MIR-1) 18"W x 36"H Mirror
 - a. Product: B-165 1836 Channel-framed mirror by Bobrick
 - 2. (MIR-2) 24"W x 36"H Mirror
 - a. Product: B-165 2436 Channel-framed mirror by Bobrick

- C. Grab Bars
 - 1. (GB-1) Grab Bar Set, Accessible Toilet Stall
 - a. B-5806 x18, x36, and x42 Straight Grab Bars by Bobrick
 - 2. (GB-2) Grab Bar Set, Ambulatory Toilet Stall
 - a. B-5806 x42 Straight Grab Bars by Bobrick
 - D. Lavatory Guards
 - 1. (LVG-1) Lavatory Guards:
 - a. Product: Lav Guard 2 E-Z Undersink Piping Cover by Truebro
 - E. (RA-12) Waste Bins: 1. Product: Janitorial 23 Gallon Black Slim Rectangular by Lavex
 - 1. Product: Janitorial 23 Gallon Black Slim Rectangular by Lavex
- 2.4 BATH ACCESSORIES
- A. Accessories for each shower stall
 - 1. (RA-9) Shower Curtain Track System
 - a. Product: 8770 Straight curtain track, anodized silver by Covoc
 - 2. (RA-11) Towel Bar with Shelf
 - a. Product: B-676 x 24 Surface-Mounted Towel Shelf with Towel Bar by Bobrick
 - B. Accessories for ADA Showers
 - 1. Roll-In Type Shower
 - a. (RA-7) Folding Shower Seat
 - 1) Product: EN275RECSEAT-WH 27 1/2" FOLDING BENCH SEAT WITH LEGS by Inpro
 - b. (GB-3) Grab Bar Set
 - 1) B-5806 x24 & x48 Straight Grab Bars by Bobrick
 - c. (RA-9) Shower Curtain Track System
 - 2. Transfer Type Shower
 - a. (RA-8) Folding Shower Seat, L-Shape
 - 1) DSGBFLDSST L-SHAPED FOLDING BENCH SEAT WITH LEGS by Inpro
 - b. (GB-4) Grab Bar Set
 - 1) B-6861 2-Wall grab bar, B5806 x18 Straight grab bar by Bobrick
 - c. (RA-9) Shower Curtain Track System
 - C. Laundry Accessories:
 - 1. (LAU-1) Adjustable Wire Shelving
 - a. Product: SUPER ERECTA WALL SHELVING SYSTEM by Metro
 - b. Size: As indicated in drawings
 - c. Material and Finish: Stainless steel, No. 4 finish.
 - D. Janitorial Accessories:
 - 1. (LAU-2) Wall-Mounted Mop/Broom Holder
 - a. Product: B-22xx24 Mop and Broom Holder by Bobrick
 - b. Size: 24"W
 - 2. (RA-12) Waste Bins
 - a. Product: Janitorial 23 Gallon Black Slim Rectangular by Lavex
- 2.5 ACCESSORIES
- A. All accessory and shower enclosure materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION

- A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION

- A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.
- B. Install plumb and level, securely and rigidly anchored to substrate.
- C. Mounting Heights and Locations: As required by accessibility regulations and as indicated on drawings.

3.4 TOLERANCES

- A. Maximum Variation From True Position: 1/4 inch.
- B. Maximum Variation From Plumb: 1/8 inch.

3.5 ADJUSTING

- A. Adjust and lubricate hardware for proper operation.

3.6 PROTECTION

- A. Protect installed work as required by the manufacturer to maintain product performance, design criteria, and warranty.

END OF SECTION

SECTION 10 44 00 - FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

- 1.1 SECTION INCLUDES
 - A. Fire extinguishers.
 - B. Fire extinguisher cabinets, recessed or surface mounted.
- 1.2 RELATED REQUIREMENTS
 - A. 06 10 00 - Rough Carpentry
 - B. 09 21 16 - Gypsum Board Assemblies: Roughed-in wall openings and blocking.
- 1.3 SUBMITTALS
 - A. Qualification Data: For manufacturer.
 - B. Product Data: Provide extinguisher operational features, color and finish, and anchorage details.
 - C. Shop Drawings: Indicate cabinet physical dimensions, rough-in measurements for recessed cabinets, wall bracket mounted measurements, and location.
 - D. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.
 - E. Maintenance Data: For user operation and maintenance of system including:
 - 1. Test, refill or recharge schedules and re-certification requirements.
 - 2. Methods for maintaining system's materials and finishes.
 - 3. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.
- 1.4 QUALITY ASSURANCE
 - A. Manufacturer Qualifications: Company specializing in the manufacture of work specified in this section with minimum 5 years of experience.
- 1.5 DELIVERY, STORAGE, AND HANDLING
 - A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

PART 2 PRODUCTS

- 2.1 DESCRIPTION
 - A. Fire extinguishers, non-rated cabinets, surface or recess mounted with accessories for proper use.
- 2.2 PERFORMANCE AND DESIGN CRITERIA
 - A. Portable fire extinguishers shall be selected and installed in accordance with this section and NFPA 10.
 - 1. 2018 IBC Section 906.
- 2.3 MATERIALS
 - A. Fire Extinguishers:
 - 1. Multi-Purpose Dry Chemical Extinguisher:
 - a. Basis of Cost: Specification is based on MP Series by Larsen's Manufacturing Co.
 - b. Performance Criteria:
 - 1) Complying with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
 - 2) Labeled by UL for the purpose specified and indicated.
 - 3) Class: A:B:C.
 - 4) UL Rating: 4A-80B:C.
 - 5) Extinguisher Model: Larsen's #MP10.
 - 6) Size: 10 pound.

- c. Features:
 - 1) Finish: Baked polyester powder coat.
 - 2) Color: Red.
 - B. Fire extinguisher cabinets, recessed or surface-mounted::
 - 1. Basis of Cost: Specification is based on Ridge Series Cabinet by Nystrom.
 - a. Performance Criteria:
 - 1) Sized to fit specified fire extinguisher.
 - b. Features:
 - 1) Door and Trim Material: Cold steel sheet with recoat able white polyester finish.
 - 2) Door Style: Convex, clear plastic bubble window.
 - 3) Trim Style: Flat with square corners.
 - 4) Glazing: Clear Acrylic.
 - 5) Finish of Cabinet Exterior Trim and Door: White enamel..
- 2.4 ACCESSORIES
- A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.
 - B. Manufacturer's accessories required by the project:
 - 1. Extinguisher Brackets: Formed steel, galvanized and enamel finished.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION

- A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION

- A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.

3.4 ADJUSTING

- A. Adjust and lubricate hardware for proper operation.

3.5 CLEANING

- A. Dispose of all waste material in accordance with project's Waste Management Plan.

3.6 PROTECTION

- A. Protect installed work as required by the manufacturer to maintain product performance, design criteria, and warranty.

3.7 SCHEDULE

- A. (FEC): For install at new partitions: Recess Mounted Cabinet; with Multi-Purpose Dry Chemical Extinguisher, Type: A:B:C, Capacity: 10 pound.
- B. (FEC-S): For install at existing partitions: Surface Mounted Cabinet; with Multi-Purpose Dry Chemical Extinguisher, Type: A:B:C, Capacity: 10 pound.

END OF SECTION

SECTION 10 56 23 - WIRE STORAGE SHELVING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Freestanding wire shelving units.
- B. Wall-mounted wire shelving units.

1.2 RELATED REQUIREMENTS

- A. 06 10 00 - Rough Carpentry: For wood blocking.
- B. 10 26 00 - Wall and Corner Protection: For installation over wall protection surfaces.
- C. 11 40 00 - Foodservice Equipment: For kitchen shelving.

1.3 SUBMITTALS

- A. Qualification Data: For Manufacturer.
- B. Product Data: Provide product criteria, characteristics, accessories, jointing and seaming methods, and termination conditions.
- C. Shop Drawings: Indicate configuration and attachment to structure.
- D. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.
- E. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- F. Maintenance Data: For user operation and maintenance of system including:
 - 1. Methods for maintaining system's materials and finishes.
 - 2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in the manufacture of work specified in this section with minimum 5 years of experience.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

PART 2 PRODUCTS

2.1 DESCRIPTION

- A. Wire shelving units for storing miscellaneous items to support Dining, Lounge, Laundry, and Pet Care rooms.

2.2 MANUFACTURERS

- A. Metro or approved equal.

2.3 MATERIALS

- A. Freestanding wire shelving units: 1. See drawings for owner furnished, contractor installed items. B. Wall-mounted wire shelving units: 1. Laundry (LAU-4): a. Basis of Design: SmartWall System by Metro b. Wall-mounted 12 gauge cold rolled steel tracks and uprights minimum 42" high with (3) adjustable wire shelves 18" deep, Type 304 stainless steel. Provide intermediate and end shelf supports. c. Finish: suitable for wet or damp environments, protective against bacteria, mold, mildew and fungus. 2. See drawings for owner furnished, contractor installed items.
 - 1. See drawings for owner furnished, contractor installed items.
- B. Wall-mounted wire shelving units:
 - 1. Laundry (LAU-4):
 - a. Basis of Design: SmartWall System by Metro

- b. Wall-mounted 12 gauge cold rolled steel tracks and uprights minimum 42" high with (3) adjustable wire shelves 18" deep, Type 304 stainless steel. Provide intermediate and end shelf supports.
 - c. Finish: suitable for wet or damp environments, protective against bacteria, mold, mildew and fungus.
2. See drawings for owner furnished, contractor installed items.

2.4 ACCESSORIES

- A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION

- A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION

- A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.

3.4 CLEANING

- A. Dispose of all waste material in accordance with project's Waste Management Plan.

3.5 PROTECTION

- A. Protect installed work as required by the manufacturer to maintain product performance, design criteria, and warranty.

END OF SECTION

SECTION 11 30 00 - RESIDENTIAL EQUIPMENT

PART 1 GENERAL

- 1.1 SECTION INCLUDES
 - A. Kitchen appliances.
 - B. Laundry appliances.
 - C. Retractable stairs.
- 1.2 RELATED REQUIREMENTS
 - A. 09 51 00 - Acoustical Ceilings: For folding attic ladder.
 - B. Division 22 - Plumbing.
 - C. Division 23 - HVAC.
 - D. Division 26 - Electrical.
- 1.3 SUBMITTALS
 - A. Qualification Data: For manufacturer.
 - B. Product Data: Manufacturer's data indicating dimensions, rated power figures, capacity, and operating features of each piece of residential equipment specified.
 - C. Copies of Warranties: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
- 1.4 QUALITY ASSURANCE
 - A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
 - B. Electric Appliances: Listed and labeled by CSA/UL and complying with NEMA standards.
 - C. Gas Appliances: Bearing design certification seal of AGA.
- 1.5 DELIVERY, STORAGE, AND HANDLING
 - A. As required by the quality standard and fabricator for a warrantable installation of the installed products to meet the Performance and Design Criteria.

PART 2 PRODUCTS

- 2.1 DESCRIPTION
 - A. Kitchen and Laundry Appliances for non-commercial use and Retractable Stairs for mechanical maintenance access.
- 2.2 PERFORMANCE AND DESIGN CRITERIA
 - A. Accessibility Requirements: For appliances required to be accessible, comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC A117.1.
- 2.3 KITCHEN APPLIANCES:
 - A. Dishwasher
 - 1. Basis of Design: Summit DW244SSADA
 - 2. Height: sized to fit below ADA compliant counter
 - 3. Width: 24"
 - 4. Finish: Stainless Steel
 - B. Undercounter Refrigerator
 - 1. Basis of Design: Summit AL54LHD
 - 2. Height: sized to fit below ADA compliant counter
 - 3. Width: 24"
 - 4. Finish: Stainless Steel
 - C. See drawings for owner furnished, contractor installed items.
- 2.4 LAUNDRY APPLIANCES
 - A. Stacked W/D Set in Laundry

1. Install owner furnished stacked W/D set (WD-1).
 2. Furnish and install Maytag Commercial MLE22PDAYW (WD-2) to match owner furnished set.
- B. See drawings for owner furnished, contractor installed washer and dryer in Pet Care.

2.5 RETRACTABLE STAIRS

- A. Folding attic ladder
1. Ceiling hatch rough opening: 24 in x 54 in.
 2. Material: aluminum with slip-resistant steps.
 3. Height: minimum 10 ft. 4. Weight capacity: minimum 375 lb.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify utility rough-ins are present and correctly located.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
B. Anchor built-in equipment in place.

3.3 ADJUSTING

- A. Adjust operating equipment to efficient operation.

3.4 CLEANING

- A. Dispose of all waste material in accordance with project's Waste Management Plan.
B. Remove packing materials from equipment.
C. Wash and clean equipment.

3.5 SCHEDULE

- A. Reference Appliance Schedule on drawings for products.

END OF SECTION

SECTION 11 40 00 - FOODSERVICE EQUIPMENT

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Non-residential kitchen equipment.
 - 2. Custom fabricated equipment.
- B. Owner-Furnished Equipment: Where indicated, Owner will furnish equipment for installation by Contractor.

1.2 COORDINATION

- A. Coordinate foodservice equipment layout and installation with other work, including layout and installation of lighting fixtures, HVAC equipment, and fire-suppression system components.
- B. Coordinate locations and requirements of utility service connections.
- C. Coordinate sizes, locations, and requirements of the following:
 - 1. Overhead equipment supports.
 - 2. Equipment bases.
 - 3. Floor depressions.
 - 4. Floor areas with positive slopes to drains.
 - 5. Floor sinks and drains serving foodservice equipment.
 - 6. Roof curbs, equipment supports, and penetrations.

1.3 SUBMITTALS

- A. Product Data: Provide product criteria, characteristics, accessories, jointing and seaming methods, and termination conditions.
- B. Shop Drawings: Indicate extents, special joint or termination conditions, and conditions of interface with other materials.
- C. Manufacturer's Installation Instructions: Indicated special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.
- D. Samples: Submit two samples of face material of fabricated equipment, manufacturer's standard size showing factory finishes, colors, and surface texture.
- E. Warranty: Submit manufacturer's warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- F. Maintenance Date: For user operation and maintenance of system including:
 - 1. Methods for maintaining system's materials and finishes.
 - 2. Precautions about cleaning materials and methods that could be detrimental to components, finishes and performance.

1.4 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Company specializing in the manufacture of work specified in this section with minimum of 5 years of experience.
- B. Designer Qualifications: Professional designer/engineer with 5 years of documented experience in design of this work and licensed in the location of the project.
- C. Installer Qualifications: Company approved by manufacturer, specializing in performing the work of this section with minimum 5 years of experience on projects of similar size and complexity.

1.5 FIELD CONDITIONS

- A. Field Measurements: Verify actual dimensions of construction contiguous with foodservice equipment by field measurements before fabrication. Indicate measurements on Coordination Drawings.

1.6 DELIVERY, STORAGE AND HANDLING

- A. As required by the quality standard and fabricator for a warrantable installation of the installed products to meet the Performance and Design Criteria.

PART 2 PRODUCTS

2.1 NON-RESIDENTIAL KITCHEN EQUIPMENT

- A. See Kitchen Equipment Schedule in drawings.

2.2 CUSTOM-FABRICATED EQUIPMENT

- A. Fabricated work surfaces, shelving and fixtures as indicated on drawings. See Kitchen Equipment Schedule.
- B. Material: Stainless steel Type 304, finish No. 4.
1. Work surfaces and fixtures: 14 gauge.
 2. Shelving: 16 gauge.
- C. Fabrication:
1. All seams and joints shall be shop welded or soldered as the nature of the material may require. Welds to be ground smooth and polished to match original finish.
 2. Rolls shall be as detailed with corners bullnosed, welded, ground and polished.
 3. Grind and polish surfaces to produce uniform finish, free of cross scratches.
 - a. Run grain of directional finishes with long dimension of each piece.
 - b. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
 4. Tables, drainboards, splashbacks and turned up edges shall have 1/2" or larger radius bends in all horizontal or vertical corners, coved at intersections unless specified otherwise.

2.3 OWNER FURNISHED EQUIPMENT

- A. See Kitchen Equipment Schedule in drawings.

2.4 MISCELLANEOUS MATERIALS

- A. Installation Accessories, General: NSF certified for end-use application indicated.
- B. Elastomeric Joint Sealant: ASTM C920; silicone. Type S (single component), Grade NS (nonsag), Class 25, Use NT (nontraffic) related to exposure, and Use M, G, A, or O as applicable to joint substrates indicated.
1. Public Health and Safety Requirements:
 - a. Sealant is certified for compliance with NSF standards for end-use application indicated.
 - b. Washed and cured sealant complies with the FDA's regulations for use in areas that come in contact with food.
 2. Cylindrical Sealant Backing: ASTM C1330, Type C, closed-cell polyethylene, in diameter greater than joint width.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install foodservice equipment level and plumb, according to manufacturer's written instructions.
1. Connect equipment to utilities.
 2. Provide cutouts in equipment, neatly formed, where required to run service lines through equipment to make final connections.
- B. Complete equipment assembly where field assembly is required.
1. Provide closed butt and contact joints that do not require a filler.
 2. Grind field welds on stainless steel equipment until smooth and polish to match adjacent finish.

- C. Install equipment with access and maintenance clearances that comply with manufacturer's written installation instructions and with requirements of authorities having jurisdiction.
- D. Install cabinets and similar equipment on bases in a bed of sealant.
- E. Install closure-trim strips and similar items requiring fasteners in a bed of sealant.
- F. Install joint sealant in joints between equipment and abutting surfaces with continuous joint backing unless otherwise indicated. Produce airtight, watertight, vermin-proof, sanitary joints.

3.2 CLEANING AND PROTECTING

- A. After completing installation of equipment, repair damaged finishes.
- B. Clean and adjust equipment as required to produce ready-for-use condition.
- C. Protect equipment from damage during remainder of the construction period.

END OF SECTION

SECTION 12 36 00 - COUNTERTOPS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Countertops for cabinetwork.
- B. Wall hung counters.

1.2 RELATED REQUIREMENTS

- A. 06 41 00 - Architectural Wood Casework: For casework supporting countertops.
- B. 10 28 00 - Toilet, Bath and Laundry Accessories: For counter mounted accessories.

1.3 SUBMITTALS

- A. Qualification Data: For design engineer and fabricator.
- B. Product Data: Provide product criteria, characteristics, accessories, jointing and seaming methods, and termination conditions.
- C. Shop Drawings: Complete details of materials and installation including concealed bracket type(s) and location(s)..
- D. Sample: For each finish product specified, minimum size 6 inches square, representing actual product, color, and patterns.
 - 1. For sealant and accessories submit manufacturer's full range of available colors and patterns for selection.
- E. Test Reports: Chemical resistance testing, showing compliance with specified requirements.
- F. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.
- G. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- H. Maintenance Data: For user operation and maintenance of system including:
 - 1. Methods for maintaining system's materials and finishes.
 - 2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.
 - 3. Recommendations on maintenance schedule.

1.4 QUALITY ASSURANCE

- A. Fabricators Qualifications: Company specializing in performing the work of this section with minimum 5 years of experience on projects of similar size and complexity.

1.5 PRE-INSTALLATION MEETING

- A. Confirm concealed bracket locations with architect once installed prior to countertop and drywall installations.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

PART 2 PRODUCTS

2.1 DESCRIPTION

- A. Wall hung and casework supported countertops fabricated from solid surface.

2.2 MATERIALS

- A. Solid Surface Countertops and Splashes: Solid surfacing sheet casting over continuous substrate.
 - 1. Flat Sheet Thickness: 3/4 inch, minimum.
 - 2. Solid Surfacing Sheet: Complying with ISFA 2-01 and NEMA LD3; acrylic or polyester resin, mineral filler and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern

consistent throughout thickness.

3. Manufacturers: Wilsonart, Corian, Inpro Corp, Hi-Macs, or as approved equal.
4. Color and Pattern: To be selected by Architect.

2.3 ACCESSORIES

- A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.
- B. Particleboard for Supporting Substrate: ANSI A208.1 Grade 2-M-2, 45 pcf (20 kg/cu m) minimum density; minimum 3/4 inch (19 mm) thick; join lengths using metal splines.
 1. Made with binder containing no urea formaldehyde.
- C. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.
- D. Joint Sealant: Mildew-resistant silicone sealant, as selected by Architect from manufacturer's full range.

2.4 FABRICATION

- A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
 1. Join lengths of tops using best method recommended by manufacturer.
 2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
 3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.
- B. Provide back/end splash wherever counter edge abuts vertical surface where indicated on drawings.
 1. Secure to countertop with concealed fasteners and secure finish surfaces with contact surfaces with a waterproof glue.
- C. Solid Surfacing: Fabricate tops up to 144 inches long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.
- D. Wall-Mounted Counters: Provide skirts, aprons, brackets, and braces as indicated on drawings, finished to match.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION

- A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION

- A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.
- B. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.
- C. Seal joint between back/end splashes and vertical surfaces.
 1. Where indicated use rubber cove molding.
 2. Where applied cove molding is not indicated use specified sealant.
- D. Joints between adjacent pieces of surfacing.
 1. Securely join with manufacturer's approved adhesive.
 2. Fill joints level with surfacing.
 3. Clamp or brace surfacing in position until adhesive sets.
 4. Joints shall be flush, tight fitting, level, and neat.

3.4 TOLERANCES

- A. Variation From Horizontal: 1/8 inch in 10 feet, maximum.

B. Offset From Wall, Countertops: 1/8 inch maximum; 1/16 inch minimum.

C. Field Joints: 1/8 inch wide, maximum.

3.5 CLEANING

A. Clean countertop surfaces thoroughly.

B. Dispose of all waste material in accordance with project's Waste Management Plan.

3.6 PROTECTION

A. Protect installed work as required by the manufacturer to maintain product performance, design criteria, and warranty.

3.7 SCHEDULE

A. (SOL-1)

1. Manufacturer: HI-MACS.

2. Style Number/Name: COLOR: WHITE QUARTZ G004.

END OF SECTION

SECTION 21 00 00 - FIRE SUPPRESSION GENERAL CONDITIONS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Conform to General Conditions, Supplementary Conditions, the modifications thereto and Division 1 - General Requirements for all work.
- B. **This is a design/build specification.** Provide all required design, permits, labor, materials and installation of fire protection work, complete and operable in accordance with these specifications and drawings. Work of Division 21 includes, but is not limited to, that as delineated in conceptual information shown on the drawings and the following specification sections:

21 00 00	Fire Suppression General Conditions
21 05 00	Common Work Results for Fire Suppression
21 13 13	Wet-Pipe Sprinkler Systems
21 13 16	Dry-pipe Sprinkler Systems

1.2 CODES AND STANDARDS

- A. Conform to following code and agency requirements having jurisdictional authority over fire protection installation.
1. International Building Code (IBC) with local amendments.
 2. National Electrical Code (NEC) NFPA 70.
 3. Requirements of OSHA.
 4. National Fire Protection Association (NFPA) Codes and Standards.
 5. ASTM, ASME, ANSI and NEMA standards, as referenced in subsequent sections.
 6. Local Water District Requirements.
 7. Local Health Department Requirements.
- B. See Division 01 - Submittal Procedures.
- C. Field Test Reports: Include results of hydrostatic and flow tests with hydraulic calculations.
- D. Design Data: Submit design calculations signed and sealed by NICET Level III Certified Designer.
- E. Provide one electronic copy of product data submittals for all products listed under "Part 2 Products" of Division 21 and all additional products noted on drawings or required for completion of project.
- F. Electronic: **All sections of Division 21 shall be submitted together in one complete PDF file with bookmarks for each section. Multi-part submittals will be returned without review.**
1. First Page: Name of Project, Owner, Location & Contracting Company.
 2. Index Page: List of specification sections with contents by Tag or item.

3. Bookmarks: Electronic bookmark of each specification section corresponding to listing in index.
- G. Clearly indicate on each page the equipment schedule designation (Tag) and/or specification section, as applicable. Indicate model and all accessories intended for use.
- H. Equipment vendor cover page with contact information shall precede submittal by that vendor.
- I. Submitted product information shall include (as applicable) but not be limited to the following information:
 1. Product description
 2. Manufacturer and model
 3. Dimensions
 4. Performance Ratings (i.e. capacity, rpm, HP, temperature)
 5. Construction Materials
 6. Ratings (i.e. UL, FM, NEMA, etc)
 7. Electrical data
 8. Vibration Isolation
 9. Controls and wiring diagrams
 10. Accessories
 11. Engineering technical data (i.e. pressure drops, leakage rates, pump curves)

1.3 SHOP DRAWINGS

- A. Prepare Shop Drawings stamped and signed by a NICET Class III Certified designer. Develop in accordance with NFPA 13 and the State and Local Fire Marshals. Submit PDF copies of these drawings for approval prior to beginning work.
- B. Submit shop drawings to Architect, Local Fire Marshal, and all other approving authorities. Drawings shall be approved by all agencies prior to fabrication or installation. **Drawings submitted for Architect's approval shall have been stamped approved by the Fire Department.**
- C. The Contractor shall draw the design team's attention to any areas in which they contemplate deviations from the conceptual information shown on the contract documents (e.g., due to site conditions).
- D. These drawings and diagrams shall show all pipe sizes as well as the manufacturer's name and catalog number of each piece of equipment used.
- E. The Architect's review of such drawings shall not relieve the Contractor of responsibility for deviations from the Contract drawings or specifications, nor shall it relieve him from responsibility for errors or omission in such drawings.
- F. Fire Sprinkler shop drawings shall indicate all relevant pipe, ceiling, and structural elevations and clearances. All elbows, offsets, and turns shall be clearly identified. All required access doors shall be shown. By submission of sheet fire sprinkler shop drawings, the Contractor acknowledges that coordination has been done to ensure that all ductwork and piping fits and no conflicts exist.
- G. Indicate layout of piping and sprinkler locations coordinated with ceiling type, lighting, structural and mechanical. Conform to symmetrical spacing of heads and integrate into locations of lights and other ceiling devices. Center heads on ceiling tiles (+/- 1") and align in straight rows.

- H. Indicate detailed pipe layout, hangers and supports, sprinklers, components and accessories. Include building sections and a plot plan showing location of underground supply connections, outside control valves, fire department connections and other equipment to be used.
- I. Indicate pipe materials used, jointing methods, supports, floor and wall penetration seals. Indicate installation layout, mounting and support details, and piping connections.
- J. Indicate layout of flexible connectors, expansion joints, expansion compensators, loops, offsets and swing joints.
- K. Indicate inertia bases and locate vibration isolators, with static and dynamic load on each.
- L. Indicate layout of finished ceiling areas indicating sprinkler locations coordinated with ceiling installation.
- M. Indicate system controls.

1.4 FIRE SPRINKLER PERMIT

- A. Fire Sprinkler contractor shall prepare all documents for permit application, submit and obtain the permit from reviewing authority. All costs and fees to obtain the permit shall be paid by the Fire Sprinkler Contractor.

1.5 QUALITY ASSURANCE

- A. Perform work in accordance with NFPA 13 and Local and/ or State Fire Marshal.
- B. Perform work in accordance with ASME B31.9 code for installation of piping systems and ASME Section IX for welding materials and procedures.
- C. CPVC fire sprinkler piping located in plenums: Peak optical density not greater than 0.5, average optical density not greater than 0.15, and flame spread not greater than 5 feet when tested in accordance with UL 1887.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years of continuous representation, a stocking distributor and service representative in the State of Washington.
- B. Contractor: Licensed and regularly engaged in the specialized design and installation of automatic sprinkler equipment as listed by UL or other nationally recognized testing laboratories. Minimum three years' experience and have installed at least five systems of comparable size.
- C. Bids by wholesalers, suppliers or any firm whose principal business is not that of manufacturing and/or installing fire protection systems are not acceptable.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store valves in shipping containers, with labeling in place.
- B. Furnish cast iron and steel valves with temporary protective coating with end caps and closures on piping and fittings. Maintain in place until installation.

- C. Accept expansion joints on site in factory packing with shipping bars and positioning devices intact. Inspect for damage.

1.8 FIELD MEASUREMENTS

- A. Where the word 'verify' is used on the documents, the contractor shall field verify the existing conditions and modify the scope of the installation as required to meet the verified conditions without additional cost to the Owner.
- B. Existing systems and utility lines indicated on drawings are in accordance with information furnished to the Architect and may not be complete. Contractor is responsible for locating, uncovering, disposing of or maintaining existing systems.

1.9 COORDINATION

- A. Visit the site and become familiar with existing conditions affecting work.
- B. Verify locations of any overhead or buried utilities on or near site. Determine such locations in conjunction with all public and private utility companies and with all authorities having jurisdiction.
- C. Mechanical drawings are diagrammatic and do not indicate all possible site conditions. The contractor shall verify all measurements, dimensions and connections on site and coordinate between trades to preclude interferences. The contractor shall provide adjustments to piping as necessary to fit conditions including but is not limited to relocation, offsets, and transitions.
- D. In the event of a conflict with other trades of work, the following priority from highest to lowest shall be followed: Structural, lighting, HVAC, plumbing/piping and sprinklers. Starting with the lowest priority, the HVAC, plumbing, and sprinkler contractors shall provide whatever materials, offsets, labor etc. is required to resolve the conflict.
- E. When discrepancies occur between plans and specifications, the Architect will determine which takes precedence and the Contractor shall perform the selected requirement at no additional cost.
- F. Prior to ordering equipment cross-check mechanical and electrical drawings and specifications to assure proper location and electrical characteristics of connections serving mechanical and electrical equipment.
- G. Advise the Architect of any modifications required to suit equipment furnished. Costs for modifications due to equipment substitution will be borne by the contractor.
- H. Wherever conflicts occur between different parts of the Contract Documents the greater quantity, the better quality, or larger size shall prevail unless the Architect informs the Contractor otherwise in writing.
- I. The scale of each drawing is relatively accurate, but the Contractor is warned to obtain the necessary dimensions for any exact takeoffs from the Architect. No additional cost to the Owner will be considered for failure to obtain exact dimensions where not clear or in error on the drawings. Any device of fixture roughed in improperly and not positioned on implied centerlines or as required by good practice must be repositioned at no cost to the Owner.

1.10 CUTTING, FITTING, REPAIRING AND PATCHING

- A. Arrange and pay for all cutting, fitting, repairing, patching and finishing of work by other trades where necessary for installation of mechanical work. Perform work only with craftsmen skilled in their respective trades.
- B. Avoid cutting, where possible, by setting sleeves, frames, etc., and by coordinating for openings in advance. Assist other trades in securing correct location and placement of rough-frames, sleeves, openings, etc. for ducts and piping.
- C. Cut all holes neatly and as small as possible to admit work. Perform cutting in manner so as not to weaken walls, partitions or floors. Drill holes required to be cut in floors without breaking out around holes.

1.11 SALVAGE

- A. Remove excess piping and plug or cap any unused branch connections. Remove scrap pipe and all other excess materials from the site.
- B. Comply with contractor's Construction Waste Management Plan.

1.12 EXTRA MATERIALS

- A. Provide extra sprinklers under provisions of NFPA 13.
- B. Furnish suitable wrenches for each sprinkler type.
- C. Furnish metal storage cabinet adjacent to alarm valve. Lettered "Automatic Sprinklers - Reserve Supplies."

1.13 FINAL APPROVAL

- A. Completion and approval of the following is required for final approval of systems.
 - 1. Execution of Architect's and Engineer's final observation reports
 - 2. Operation and maintenance instruction
 - 3. Operation and maintenance manuals submitted
 - 4. Equipment cleaning
 - 5. Record drawings submitted
- B. See Division 01.

1.14 OPERATING AND MAINTENANCE INSTRUCTIONS

- A. General: In addition to requirements of Division 01, following initial operation of mechanical systems and prior to acceptance by the Architect, perform the following services.
- B. At least two weeks prior to each instruction period, give written notification of readiness to proceed to the Architect and Owner, and obtain mutually acceptable dates.
- C. Conduct demonstrations and instructions for the Owner's representatives, pointing out requirements for operating, servicing and maintaining equipment and systems. Describe general system operation and specific equipment functions. Cover all equipment calibration, setpoint adjustment, safeties and alarms.
- D. Furnish qualifications of Contractor's personnel in charge of the instruction; foreman position is minimum acceptable. Where equipment startup is performed by supplier's or

manufacturer's personnel, those personnel should also provide training on that equipment.

- E. During demonstrations and instructions include and reference information from maintenance manuals and contract drawings.
 - 1. Provide documentation of all instruction which includes:
 - a. Date and time of instruction
 - b. Name, affiliation and qualifications of the instructor
 - c. Name and affiliation of the attendees
 - d. Topics, systems, and equipment covered
 - e. Length of instruction
- F. Minimum duration of instruction period is TBD.

1.15 OPERATING AND MAINTENANCE MANUALS

- A. Contents: Furnish, in accord with Division 1, one PDF and one bound copy of operating and maintenance manuals to include the following:
 - 1. Manufacturers, suppliers, contractor names, addresses and phone numbers.
 - 2. Warranty service contractors' names, address and phone numbers (if different from above).
 - 3. Schedule and description of routine maintenance for each component to include oiling, lubrication and greasing data.
 - 4. Test data log.
 - 5. Manufacturer's cuts and rating tables, including brochures for all submittal items.
 - 6. Part numbers of all replaceable items.
 - 7. Control diagrams and operation sequence.
 - 8. Written guarantees.
 - 9. Record drawings corrected and completed.
 - 10. Completed equipment start-up forms and checklists.
- B. Binders:
 - 1. Furnish typewritten or printed index and tabbed dividers between principal categories.
 - 2. Bind each manual in a hard-backed loose-leaf binder.
- C. Imprint on cover:
 - 1. Name of project.
 - 2. Owner.
 - 3. Location of project.
 - 4. Architect.
 - 5. Contractor.
 - 6. Year of completion.
- D. Imprint on backing:
 - 1. Name of project.
 - 2. Year of completion.
- E. Submittals:
 - 1. Preliminary Copies: Prior to scheduled completion of the project, provide one PDF copy for review by the Architect.
 - 2. Final Copies: After approval of the preliminary copy, submit one PDF and one bound copy to the Owner.

1.16 EQUIPMENT AND PIPE CLEANING

- A. Clean interior and exterior of all equipment. Equipment shall be free of dirt, construction debris, corrosion, etc.
- B. Adequate provisions shall be made during construction to eliminate dirt, debris or other material from entering and collecting inside of pipe. Any collection of material shall be thoroughly cleaned before equipment startup and if necessary before owner occupancy.
- C. Clean exterior of all exposed pipe.
- D. Flush entire piping system of foreign matter.

1.17 RECORD DRAWINGS

- A. See Division 1.
- B. Submit two digital files with all drawings in PDF and AutoCAD format.
- C. Show location of equipment and size of piping. Where appropriate provide tag or label identification for all valves and similar equipment. Indicate locations and elevations of exterior pipe and utility connections. Maintain continuously updated drawings during progress of project.

1.18 TESTING

- A. Provide completed start-up forms and checklists.

1.19 WARRANTIES AND CONTRACTOR'S GUARANTEE

- A. Furnish one year warranty from date of substantial completion for all systems unless specifically noted otherwise.
- B. All work, material and equipment shall be free of defect, complete and in perfect operating order at time of delivery to Owner.
- C. Without cost to Owner, **correct all defects and failures discovered within one year from date of final acceptance**, except when in the opinion of the Architect such condition is due to neglect or carelessness of the Owner.
- D. The guarantee of the Contractor is independent of shorter time limits by any manufacturer of equipment he has furnished. Submit with Operation and Maintenance Manual all guarantees which exceed one year.
- E. Make all necessary adjustments during first year of operation.
- F. The presence of any inspector or observer during any construction does not relieve the Contractor from responsibility for defects discovered after completion of the work.

PART 2 **NOT USED**

PART 3 **EXECUTION**

3.1 DOCUMENTATION

- A. Additional plan submittals to Local Fire Marshal: If additional drawing submittals are required at any time during construction contractor shall prepare and submit drawings, review with Fire Marshal, and pick up subsequent approved drawings.

3.2 INSPECTION

- A. Do not allow any work to be covered up or enclosed until inspected, tested and approved by the Architect and all authorities having jurisdiction over the work.
- B. Should any work be enclosed or covered up before such inspection and test, Contractor shall at his own expense uncover work, and after it has been inspected, tested and approved, make all repairs as necessary to restore all work disturbed by him to its original condition.

3.3 INTERFACE WITH OTHER PRODUCTS

- A. Verify devices are installed and connected to fire alarm system.

END OF SECTION

SECTION 21 05 00 - COMMON WORK RESULTS FOR FIRE SUPPRESSION

PART 1 **GENERAL**

1.1 SUMMARY

- A. Section Includes:
 - 1. Pipe
 - 2. Valves
 - 3. Hangers and Support
 - 4. Expansion Fittings and Loops
 - 5. Seismic Controls
 - 6. Identification

1.2 EXPANSION AND SEISMIC DESIGN REQUIREMENTS

- A. Provide structural work and equipment required for expansion and contraction of piping. Verify anchors, guides, and expansion joints provide and adequately protect system.
- B. Expansion Compensation Design Criteria:
 - 1. Installation Temperature: 50 degrees F.
 - 2. Fire Protection System Temperature: 90 degrees F.
 - 3. Safety Factor: 30 percent.
- C. Seismic performance: Provide seismic restraint in compliance with local jurisdiction and IBC 1613 requirements.

1.3 QUALITY ASSURANCE

- A. Through penetration firestopping of fire rated assemblies: ASTM E814 with 0.10" w.g. minimum positive pressure differential. Minimum 1-hour protection.
- B. Installed products shall have surface Burning Characteristics: 25/50 flame spread/smoke developed index when tested in accordance with ASTM E84.
- C. Perform work in accordance with local jurisdiction's requirements and AWS D1.1 for welding hanger and support attachments to building structure.
- D. Conform to ASME A13.1 for color scheme for identification of piping systems and accessories.

PART 2 **PRODUCTS**

2.1 BURIED PIPING

- A. Steel Pipe: ASTM A53 Grade B, ASTM A135, ASTM A795 Schedule 40 black.
 - 1. Steel Fittings: ASME B16.9, wrought steel, butt welded; ASTM A234, wrought carbon steel and alloy steel; with half-lapped 10 mil polyethylene tape.
 - 2. Cast Iron Fittings: ASME B16.1 flanges and flanged fittings.
 - 3. Joints: AWS D1.1, welded.
 - 4. Protection: ASME C105 polyethylene jacket with heat shrink sleeves or double layer, half-lapped 10 mil polyethylene tape to 6" above grade.
- B. Copper Tubing: Type K annealed. ASTM B75, ASTM B88, ASTM B251.

1. Fittings: Cast copper alloy ASME B16.18; wrought copper and bronze, ASME B16.22. Pressure type solder joint.
2. Joints: Silver braze, AWS A5.8 Classification BCuP-3 or BCuP-4; Solder, ASTM B32 Grade 95TA.
3. Protection: ASME C105 polyethylene jacket with heat shrink sleeves or double layer, half-lapped 10 mil polyethylene tape to 6" above grade.

2.2 ABOVE GROUND PIPING

- A. Steel Pipe: ASTM A53 Grade B, ASTM A135, ASTM A795 Schedule 40 black; Schedule 10 UL listed light wall; ASTM A-795 Type E, Grade A Eddy-Flow or Dyna-Flow UL listed thin wall flow pipe.
1. Steel Fittings: ASME 16.9, wrought steel, butt welded; ASME B16.25, butt weld; ASTM A234, wrought carbon steel and alloy steel; ASME B16.5, steel flanges and fittings; ASME B16.11, forged steel socket welded and threaded.
 2. Cast Iron Fittings: ASME B16.1 flanges and flanged fittings; ASME B16.4, threaded fittings.
 3. Malleable Iron Fittings: ASME B16.3, threaded.
 4. Ductile Iron Fittings: ASTM A536, Grade 65-45-12. In applicable sizes, fittings shall be short pattern, with flow equal to standard pattern fittings. Basis of Design: Victaulic FireLock.
 5. Mechanical Grooved Couplings: Ductile iron housing clamps to engage and lock, "C" shaped elastomeric sealing gasket, steel bolts, nuts, and washers. ASTM A449. Victaulic, Gruvlok or approved equal.
 - a. Rigid Type: Housings cast with offsetting, angle-pattern, bolt pads to provide system rigidity and support and hanging in accordance with NFPA-13, fully installed at visual pad-to-pad offset contact. (Couplings that require exact gapping at specific torque ratings are not permitted.). Basis of Design: Victaulic Style 009N and 107N.
 - b. Flexible Type: For use in locations where vibration attenuation and stress relief are required: Basis of Design: Victaulic Style 177 or Style 77.
 6. Installation-Ready™ fittings for Schedule 40/10 grooved end steel piping in fire protection applications sizes 1-¼ thru 2½ inches. Ductile iron housing conforming to ASTM A-536, Grade 65-45-12, with Installation-Ready™ ends, pre-lubricated Grade "E" EPDM Type 'A' gasket, and ASTM A449 electroplated steel bolts and nuts. UL listed for a working pressure of 300 psi and FM approved for working pressure 365 psi.
- B. Steel Pipe: ASTM A53 Grade B, ASTM A135, ASTM A795 Schedule 40 galvanized. Use only for dry-pipe sprinkler system and dry standpipes.
1. Steel Fittings: ASME 16.9, wrought steel, butt welded; ASME B16.25, butt weld; ASTM A234, wrought carbon steel and alloy steel; ASME B16.5, steel flanges and fittings; ASME B16.11, forged steel socket welded and threaded.
 2. Cast Iron Fittings: ASME B16.1 flanges and flanged fittings; ASME B16.4, threaded fittings.
 3. Malleable Iron Fittings: ASME B16.3, threaded.
 4. Ductile Iron Fittings: ASTM A536, Grade 65-45-12. In applicable sizes, fittings shall be short pattern, with flow equal to standard pattern fittings. Basis of Design: Victaulic FireLock.
 5. Mechanical Grooved Couplings: Malleable galvanized housing clamps to engage and lock, "C" shaped elastomeric sealing gasket, steel bolts, nuts, and washers. ASTM A449. Victaulic, Gruvlok or approved equal.
 - a. Rigid Type: Housings cast with offsetting, angle-pattern, bolt pads to provide system rigidity and support and hanging in accordance with NFPA-13, fully installed at visual pad-to-pad offset contact. (Couplings

- that require exact gapping at specific torque ratings are not permitted.).
Basis of Design: Victaulic Style 009N and 107N.
- b. Flexible Type: For use in locations where vibration attenuation and stress relief are required: Basis of Design: Victaulic Style 177 or Style 77.
6. Installation-Ready™ fittings for Schedule 40 grooved end steel piping in fire protection applications sizes 1-¼ thru 2½ inches. Ductile iron housing conforming to ASTM A-536, Grade 65-45-12, with Installation-Ready™ ends, pre-lubricated Grade “E” EPDM Type ‘A’ gasket, and ASTM A449 electroplated steel bolts and nuts. UL listed for a working pressure of 300 psi and FM approved for working pressure 365 psi.
- C. Steel Pipe: ASTM A135 Grade A, UL threadable thin wall, black.
- 1. Cast Iron Fittings: ASME B16.4, threaded fittings.
 - 2. Malleable Iron Fittings: ASME B16.3 threaded type.

2.3 VALVES

- A. Manufacturers: UL & FM approved by Nibco, Stockham, Milwaukee or approved equal.
- B. Gate Valves:
- 1. Over 2 inches: Iron body, bronze trim, rising stem pre-grooved for mounting tamper switch, hand wheel, OS&Y, solid bronze or cast iron wedge, flanged or grooved ends. Basis of Design: Victaulic Series 771.
 - 2. Over 2 inches: Iron body, bronze trim, non-rising stem with bolted bonnet, solid bronze wedge, flanged or grooved ends. Basis of Design: Victaulic Series 772, for use with Series 773 (wall) or 774 (upright) post.
- C. Ball Valves:
- 1. Up to and including 2 inches: Bronze two piece body, brass, chrome plated bronze, or stainless steel ball, teflon seats and stuffing box ring, lever handle, threaded or sweat fitting ends.
 - 2. Supervised valves provided with weatherproof actuator housing, handwheel, and supervisory switches. Basis of Design: Victaulic Series 728.
- D. Butterfly Valves:
- 1. Bronze Body: Stainless steel disc, resilient replaceable seat, threaded or grooved ends, extended neck, hand wheel and gear drive and integral indicating device, and built-in tamper proof switch where required.
 - 2. Cast or Ductile Iron Body: Cast or ductile iron, chrome or nickel plated ductile iron or aluminum bronze disc, resilient replaceable pressure-responsive EPDM seat, stainless steel stem (offset from the disc centerline to provide complete 360-degree circumferential seating), wafer, lug, or grooved ends. With extended neck, weatherproof actuator housing with hand wheel and gear drive and integral indicating device where required. Basis of Design: Victaulic Series 705.
- E. Check Valves:
- 1. Up to 2 inches: Bronze body and swing disc, rubber seat, threaded ends.
 - 2. 2 to 4 inches: Iron body, bronze trim, swing check with rubber disc, renewable disc and seat, grooved or flanged ends.
 - 3. 2 inches and over: Ductile iron body, stainless steel or bronze disc with resilient seal, or elastomer coated ductile iron disc with welded-in nickel seat. Stainless steel spring. Wafer, grooved or flanged ends. Basis of Design: Victaulic Series 717.
- F. Drain Valves:
- 1. Compression Stop: Bronze with hose thread nipple and cap.

2. Ball Valve: Brass with cap and chain, 3/4 inch hose thread.

2.4 BACKFLOW ASSEMBLY

- A. Double check valve, detector check or as jurisdiction requires. FDA approved epoxy coated cast iron check valve bodies with bronze seats. Furnish with bronze body ball valve test cocks. Suitable for supply pressures to 175 psi and water temperatures to 140 degrees. Tamper switches on gate valves for monitoring. Ames, Watts, Apollo, FEBCO, Wilkins or approved.

2.5 PIPE HANGERS AND SUPPORTS

- A. Conform to NFPA 13.
- B. Hangers for Pipe Sizes 1 to 6 inch: Carbon steel, adjustable swivel, band hanger. Tolco Fig 200 or equal.
- C. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
- D. Wall Support for Pipe Sizes to 3 inches: Cast iron hook.
- E. Wall Support for Pipe Sizes 4 inches and Over: Welded steel bracket and wrought steel clamp.
- F. Vertical Support: Steel riser clamp.
- G. Floor Support: Cast iron pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

2.6 FLEXIBLE PIPE CONNECTORS

- A. Manufacturers: Metraflex, Mason or approved equal.
- B. Steel Piping:
 1. UL Listed
 2. Inner Hose: Stainless Steel.
 3. Exterior Sleeve: Braided stainless steel.
 4. Joint: Flanged, threaded with union or welded, as specified for pipe joints.
 5. Maximum offset: 3/4 inch.

2.7 FLEXIBLE SPRINKLER HOSE CONNECTIONS

- A. Manufacturers: Vic-Flex, FlexHead or approved equal.
- B. The drop system shall consist of a braided type 304 stainless steel flexible tube, zinc plated steel Male threaded nipple or Victaulic FireLock IGS Groove Style 108 coupling for connection to branch-line piping, and a zinc plated steel reducer with a female thread for connection to the sprinkler head.
- C. Performance:
 1. FM Approved for its intended use pursuant to FM 1637 Approval Standard for Flexible Sprinkler Hose with Threaded End Fittings.
 2. UL Listed for its intended use pursuant to UL 2443 Standard for Flexible Sprinkler Hose with Fittings for Fire Protection Service.
 3. Seismically qualified for use pursuant to ICC-ES AC-156 Acceptance Criteria for Seismic Qualification by Shake-Table Testing of Nonstructural Components and Systems.

- D. Flexible Hose Assemblies and End Fittings:
 - 1. 100% Type 304 Stainless Steel.
 - 2. Straight Hose Assembly or Elbow Hose Assembly.
 - 3. ½ inch or ¾ inch outlet.
 - 4. 175 psi / 300 psi maximum rated pressure.
 - 5. Fully welded non-mechanical fittings, braided, leak-tested with minimum 1 inch true-bore internal corrugated hose diameter.
 - 6. Union joints shall be provided for ease of installation.

- E. Ceiling Bracket:
 - 1. Type G90 Galvanized Steel.
 - 2. The bracket shall allow installation before the ceiling tile is in place.
 - 3. Direct attachment type, having integrated snap-on clip ends positively attached to the ceiling using tamper-resistant screws.
 - 4. Flexible Hose Attachment: Removable hub type with set screw.

2.8 EXPANSION JOINTS

- A. Manufacturers: Metraflex, Mason or approved equal.

- B. Flexible Expansion Loop (seismic joint):
 - 1. UL listed
 - 2. Stainless steel hose & double stainless steel braid, carbon steel fittings.
 - 3. Two flexible sections of hose and braid, two 90° elbows and a 180° return, assembled.
 - 4. Support nut and drain plug at bottom of 180° return.
 - 5. Provide nesting for multiple pipe runs.

- C. Stainless Steel Bellows (expansion):
 - 1. Low corrugation, non-controlled, two ply, 304 stainless steel.
 - 2. ANSI class 150/300 flanges, grooved or welded ends.
 - 3. 150/300 psi rated, maximum working temperature of 850 F.

- D. External Ring Controlled Stainless Steel Bellows (expansion):
 - 1. High Corrugation, self-equalizing, ring controlled, single ply, 304 stainless steel.
 - 2. ANSI class 150/300 flanges, grooved or welded ends.
 - 3. External sheet metal covers.
 - 4. 300 psi rated, 500 F working.

2.9 FIRESTOPPING-APPLIED

- A. Manufacturers: RectorSeal, Dow Corning, 3M Fire Protection or approved equal.

- B. General:
 - 1. Fire stopping materials shall conform to Flame (F) and Temperature (T) ratings as required by applicable building codes and tested by nationally accepted test agencies per ASTM E 814 or UL 1479 fire tests for through penetrations, and ASTM E 1966 or UL 2079 for construction joints, and UL 2307 for perimeter edge joints.
 - 2. Fire stopping material shall be free of asbestos, PCBs, ethylene glycol, and lead.
 - 3. Do not use any product containing solvents or that requires hazardous waste disposal.
 - 4. Fire stopping shall be performed by a contractor trained or approved by firestop manufacturer.
 - 5. Select products with rating not less than rating of wall or floor being penetrated.

- C. Single Source Responsibility: Provide firestop systems for all conditions from a single supplier.
- D. Product Description: Provide Latex caulk/sealant, Silicone caulk/sealant, Intumescent Wrap Strip, Firestop Putty, Firestop Collar or Intumescent Sleeve to meet each specific application and performance requirement.
- E. Primer: Type recommended by firestopping manufacturer for specific substrate surfaces and suitable for required fire ratings.
- F. Installation Accessories: Provide clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.
 - 1. Forming/Damming Materials: Mineral fiberboard, backer rod or other type recommended by Manufacturer's tested system.

2.10 FIRE STOPPING-CAST IN PLACE

- A. Manufacturers: Presealed Systems "Hydro Flame" or approved equal.
- B. Product Description: Factory assembled for use in concrete floors, outer sleeve lined with intumescent strip, radial extended flange, waterstop gasket/mid-body seal.
- C. General: UL listed system with 3 hour fire rating. Watertight, Class 1 with 3 feet head pressure for 72 hours.
- D. Installation: Provide device based upon pipe type, size and concrete thickness. Align with penetration layout and nail in place. Secure cap prior to pouring concrete. Deburr and clean debris from pipe prior to installation. Coat pipe end with compatible lubricant as necessary.

2.11 MECHANICAL SLEEVE SEALS

- A. Manufacturers: Metraflex Metraseal, Thunderline Link-Seal or approved equal.
- B. Product Description: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

2.12 MECHANICAL FIRESTOPPING SLEEVE SEALS

- A. Manufacturers: Metraflex Metraseal 120 or approved equal.
- B. Product Description: Modular mechanical type, consisting of interlocking intumescent synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation. UL listed for 2 hour fire protection.

2.13 PIPING ACCESSORIES

- A. Manufacturers: Grinnell, EMCO Wheaton, OPW or approved equal.
- B. Pipe Alignment Guides: Two piece welded steel with enamel paint, bolted, with spider to fit standard pipe, frame with four mounting holes, clearance for minimum 1 inch thick insulation, minimum 3 inch travel.

- C. Swivel Joints: Fabricated steel, bronze, ductile Iron or cast steel body, double ball bearing race, field lubricated, with rubber or Buna-N o-ring seals.

2.14 PIPE MARKERS

- A. Color and Lettering shall conform to ASME A13.1.
- B. Fire service piping labels shall be red background with white lettering. Legend shall indicate service of pipe.
- C. Plastic Pipe Markers: Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering. Larger sizes may have maximum sheet size with spring fastener.
- D. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.

PART 3 EXECUTION

3.1 PREPARATION - PIPING

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and foreign material, from inside and outside, before assembly.
- C. Prepare piping connections to equipment with flanges, unions or grooved couplings.

3.2 INSTALLATION - PIPING

- A. Install piping in accordance with NFPA 13 for sprinkler systems.
- B. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.
- C. Install piping to conserve building space, to not interfere with use of space and other work.
- D. Group piping whenever practical at common elevations.
- E. CPVC sprinkler piping may only be installed in areas where it is completely concealed, i.e. behind sheet rock or suspended ceilings. Otherwise piping must be metallic.
- F. Install pipe sleeve at piping penetrations through footings, partitions, walls, and floors. Seal pipe and sleeve penetrations to maintain fire resistance equivalent to fire separation.
- G. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- H. Pipe Hangers and Supports:
 - 1. Install in accordance with NFPA 13.
 - 2. Install hangers with minimum 1/2 inch space between finished covering and adjacent work.
 - 3. Place hangers within 12 inches of each horizontal elbow.
 - 4. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.

5. Support vertical piping at every floor. Support riser piping independently of connected horizontal piping.
 6. Where installing several pipes in parallel and at same elevation, provide multiple or trapeze hangers.
 7. Install copper plated hangers and supports for copper piping.
 8. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
- I. Slope piping and arrange systems to drain at low points.
 - J. Prepare pipe, fittings, supports, and accessories for finish painting. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
 - K. Do not penetrate building structural members unless indicated.
 - L. Where more than one piping system material is specified, install compatible system components and joints. Install flanges, union, and couplings at locations requiring servicing.
 - M. Die cut threaded joints with full cut standard taper pipe threads with red lead and linseed oil or other non-toxic joint compound applied to male threads only.
 - N. Install valves with stems upright or horizontal, not inverted. Remove protective coatings after installation.
 - O. Install gate, ball, or butterfly valves for shut-off or isolating service.
 - P. Install drain valves at main shut-off valves, low points of piping and apparatus.

3.3 INSTALLATION – EXPANSION FITTINGS AND LOOPS

- A. Install Work in accordance with ASME B31.9.
- B. Provide structural work and equipment required for expansion and contraction of piping. Verify anchors, guides, and expansion joints provide and adequately protect system.
- C. Provide support and anchors for controlling expansion and contraction of piping. Provide loops, pipe offsets, and swing joints, or expansion joints where required.
- D. Provide grooved piping systems with minimum one joint per inch pipe diameter instead of flexible connector supported by vibration isolation. Grooved piping systems need not be anchored.

3.4 INSTALLATION – SEISMIC CONTROLS

- A. Provide seismic restraints and hangers in compliance with NFPA 13.
- B. Seismic Bracing: Follow NFPA 13 and the following.
 1. Bracing shall be bidder designed to resist seismic loading.
 2. Provide seismic calculations as required for $I_p = 1.5$.

3.5 INSTALLATION – FIRESTOPPING AND SEALS AT PARTITIONS

- A. Install material at fire rated construction perimeters and openings containing penetrating sleeves, piping and other items requiring firestopping.

- B. Apply primer where recommended by manufacturer for type of firestopping material and substrate involved, and as required for compliance with required fire ratings. Primers must comply with VOC limits per Green Seal standards GS-03 (1997), GS-11 (1993), or SCAQMD Rule #1113 (2004).
- C. Place intumescent coating in sufficient coats to achieve rating required.
- D. Clean adjacent surfaces of firestopping materials.
- E. Fire Rated Surface:
 - 1. Seal opening at floor, wall, partition, ceiling, and/or roof as follows:
 - a. Install sleeve through opening and extending beyond minimum of 1 inch on both sides of building element.
 - b. Size sleeve allowing minimum of 1 inch void between sleeve and building element.
 - c. Pack void with backing material.
 - d. Seal ends of sleeve with UL listed fire resistive silicone compound to meet fire rating of structure penetrated.
- F. Non-Rated Surfaces:
 - 1. Seal opening through non-fire rated wall, partition, floor, ceiling, and/or roof opening as follows:
 - a. Install sleeve through opening and extending beyond minimum of 1 inch on both sides of building element.
 - b. Size sleeve allowing minimum of 1 inch void between sleeve and building element.
 - 2. Install escutcheons where piping penetrates non-fire rated surfaces in occupied spaces.
 - 3. Exterior wall openings below grade: Assemble rubber links of mechanical sealing device to size of piping and tighten in place, in accordance with manufacturer's instructions.
 - 4. Interior partitions: Seal pipe penetrations air tight. Apply sealant to both sides of penetration to completely fill annular space between sleeve and conduit.

3.6 INSTALLATION - IDENTIFICATION

- A. Identification is not required on sprinkler branch lines and run-outs to heads.
- B. Identification is required on:
 - 1. Bulk mains
 - 2. Incoming fire service
 - 3. FDC piping
 - 4. Standpipe (not in stairwell)
- C. Identify service and flow direction (and pressure where more than one pressure is used). Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and tee, at each side of penetration of structure or enclosure, and at each obstruction. Install a minimum of one label for each story traversed by piping.
- D. Install plastic nameplates with corrosive-resistant mechanical fasteners, or adhesive.
- E. Install labels with sufficient adhesive for permanent adhesion.

3.7 INTERFACE WITH OTHER PRODUCTS

- A. Inserts:
1. Install inserts for placement in concrete forms.
 2. Install inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
 3. Install hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.
 4. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.

3.8 MANUFACTURER'S FIELD SERVICES

- A. Furnish inspection services by flexible pipe manufacturer's representative for final installation and certify installation is in accordance with manufacturer's recommendations and connectors are performing satisfactorily.

END OF SECTION

SECTION 21 13 13 - WET-PIPE SPRINKLER SYSTEMS

PART 1 **GENERAL**

1.1 SUMMARY

- A. Section includes wet-pipe sprinkler system design, installation, and certification.

1.2 SYSTEM DESCRIPTION

- A. This section requires design and installation of wet pipe sprinkler systems for building fire protection. For areas subject to freezing, see Section 21 13 16 for design and installation of dry pipe sprinkler systems.
- B. Perform work in accordance with NFPA 13, FM approval guide, state and local municipality having jurisdiction.
- C. Determine volume and pressure of incoming water supply from water flow test data. Revise design when test data become available prior to submittals.
- D. Interface system with building fire and smoke alarm system.
- E. Provide fire department connections. Note if location(s) are indicated on Drawings.
- F. Fire suppression system shall not contain ozone depleting substances such as halons, CFC's and HCFC's.

PART 2 **PRODUCTS**

2.1 SPRINKLERS

- A. Manufacturers: Tyco, Reliable, Viking or approved equal.
- B. Provide "quick response" heads in all light hazard occupancies.
- C. Suspended T-bar Ceiling Type:
 - 1. Type: Semi-recessed pendant type with matching escutcheon plate.
 - 2. Sprinkler and escutcheon plate finish: Chrome factory finish.
 - 3. Fusible link: Glass bulb type temperature rated for specific area hazard.
- D. GWB Ceiling Type:
 - 1. Type: Semi-recessed pendant type with matching escutcheon plate.
 - 2. Sprinkler and escutcheon plate finish: Chrome factory finish.
 - 3. Fusible link: Glass bulb type temperature rated for specific area hazard.
- E. Exposed Area Type:
 - 1. Type: Standard upright type.
 - 2. Finish: Brass
 - 3. Fusible Link: Glass bulb type temperature rated for specific area hazard.
- F. Side wall Type:
 - 1. Type: Semi-recessed horizontal side wall type.
 - 2. Sprinkler and escutcheon plate finish: Chrome factory finish.
 - 3. Fusible Link: Glass bulb type temperature rated for specific area hazard.

- G. Guards: Finish matching sprinkler finish.

2.2 PIPING SPECIALTIES

- A. Electric Alarm: Electrically operated red enameled gong with pressure alarm switch.
- B. Water Flow Switch: Vane type switch for mounting horizontal or vertical, with two contacts.

2.3 FIRE DEPARTMENT CONNECTION

- A. Manufacturer: Potter-Roemer or approved equal.
- B. Wall Type: Cast brass flush mounted wall type with brass finish.
- C. Post Type: Free standing type with ductile iron pedestal red enameled finish.
- D. Threaded Inlets: Two-way 2-1/2" connections with fire department threads. Threaded cast brass plug and chain of matching material and finish.
- E. Storz Inlet: Hard coated aluminum with blind cap and chain.
- F. Drain: 3/4 inch automatic drip, outside or connect to drain.
- G. Label: "Sprinkler - Fire Department Connection".

2.4 ELECTRICAL CHARACTERISTICS AND COMPONENTS

- A. Controls: Supervisory switches. Coordinate with fire alarm section of work.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with NFPA 13.
- B. Install buried shut-off valves in valve box. Furnish post indicator.
- C. Install pressure gauges on each side of sprinkler alarm valve.
- D. Install approved backflow assembly at sprinkler system water source connection.
- E. Locate fire department connection with sufficient clearance from walls, obstructions, or adjacent Siamese connectors to allow full swing of fire department wrench handle.
- F. Locate outside alarm on building exterior wall.
- G. Place pipe runs to minimize obstruction to other work.
- H. It shall be a specific requirement that insofar as possible, all sprinkler system mains and branches shall be installed as close as possible to the structural members, not the ceiling.
- I. Install main piping in concealed spaces above finished ceilings or soffits; branch piping in joist space or other concealed space to sprinkler heads.

- J. Center sprinklers in two directions in ceiling tile and install piping offsets.
- K. Install guards on sprinklers exposed to potential damage.
- L. Provide drains at system low points.
- M. Hydrostatically test entire system.
- N. Testing must be witnessed by Authorities having jurisdiction.

3.2 CLEANING

- A. Flush entire piping system of foreign matter.

3.3 PROTECTION OF INSTALLED CONSTRUCTION

- A. Apply masking tape or paper cover to protect concealed sprinklers, cover plates, and sprinkler escutcheons not receiving field paint finish. Remove after painting. Replace painted sprinklers with new.

END OF SECTION

SECTION 21 13 16 - DRY-PIPE SPRINKLER SYSTEMS

PART 1 **GENERAL**

1.1 SUMMARY

- A. Section includes dry-pipe sprinkler system design, installation, and certification.

1.2 SYSTEM DESCRIPTION

- A. Determine volume and pressure of incoming water supply from water flow test data. Revise design when test data become available prior to submittals.
- B. Interface system with building fire and smoke alarm system.
- C. Provide fire department connections. Note if location(s) are indicated on Drawings.
- D. Fire suppression system shall not contain ozone depleting substances such as halons, CFC's and HCFC's.

1.3 QUALITY ASSURANCE

- A. Perform work in accordance with NFPA 13, FM approval guide, state and local municipality having jurisdiction.

PART 2 **PRODUCTS**

2.1 SPRINKLERS

- A. Manufacturers: Tyco, Reliable, Viking or approved equal.
- B. Suspended T-bar Ceiling Type:
 - 1. Type: Semi-recessed pendant type with matching escutcheon plate.
 - 2. Sprinkler and escutcheon plate finish: Chrome factory finish.
 - 3. Fusible Link: Glass bulb type temperature rated for specific area hazard.
- C. GWB Ceiling Type:
 - 1. Type: Semi-recessed pendant type with matching escutcheon plate.
 - 2. Sprinkler and escutcheon plate finish: Chrome factory finish.
 - 3. Fusible Link: Glass bulb type temperature rated for specific area hazard.
- D. Exposed Area Type:
 - 1. Type: Standard upright type.
 - 2. Finish: Brass
 - 3. Fusible Link: Glass bulb type temperature rated for specific area hazard.
- E. Side wall Type:
 - 1. Type: Semi-recessed horizontal side wall type with matching escutcheon plate.
 - 2. Sprinkler and escutcheon plate finish: Chrome factory finish.
 - 3. Fusible Link: Glass bulb type temperature rated for specific area hazard.
- F. Guards: Finish matching sprinkler finish.

2.2 PIPING SPECIALTIES

- A. Dry Pipe Sprinkler Alarm Valve: Check type valve with divided seat ring, bronze main seat and mechanism to automatically actuate electric alarm with test and drain. Pressure gauges each side of valve. Viking or approved equal.
- B. Electric Alarm: Electrically operated red enameled gong with pressure alarm switch.
- C. Pressure Switch: Two contacts; rated 10 amp at 125 volt AC and 2.5 amp at 24 volt DC.

2.3 FIRE DEPARTMENT CONNECTION

- A. Manufacturer: Potter-Roemer or approved equal.
- B. Wall Type: Cast brass flush mounted wall type with brass finish.
- C. Post Type: Free standing type with ductile iron pedestal red enameled finish.
- D. Threaded Inlets: Two-way 2-1/2" connections with fire department threads. Threaded cast brass plug and chain of matching material and finish.
- E. Storz Inlet: Hard coated aluminum with blind cap and chain.
- F. Drain: 3/4 inch automatic drip, outside or connected to drain.
- G. Label: "Sprinkler - Fire Department Connection".

2.4 AIR COMPRESSOR

- A. Manufacturers:
 - 1. Bell & Gossett
 - 2. Quincy
 - 3. Ingersoll Rand
 - 4. Jenny
 - 5. Gast
- B. Compressor: Single unit, electric motor driven, motor, motor starter, safety valves, check valves, air maintenance device incorporating electric pressure switch and unloading valve.

2.5 ELECTRICAL CHARACTERISTICS AND COMPONENTS

- A. Controls: Supervisory switches, Water Level Supervisory Switches, Tank Temperature Supervisory Switches, Room Temperature Supervisory Switches.
- B. Disconnect Switch: Factory mount in on equipment.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with NFPA 13.
- B. Install buried shut-off valves in valve box. Install with post indicator.
- C. Install approved backflow assembly at sprinkler system water source connection.

- D. Locate fire department connection with sufficient clearance from walls, obstructions, or adjacent Siamese connectors to allow full swing of fire department wrench handle.
- E. Install outside alarm on exterior building wall.
- F. Install piping to minimize obstruction with other work.
- G. It shall be a specific requirement that insofar as possible, all sprinkler system mains and branches shall be installed as close as possible to the structural members, not the ceiling.
- H. Install main piping in concealed spaces above finished ceilings or soffits; branch piping in joist space or other concealed space to sprinkler heads.
- I. Center sprinklers in two directions in ceiling tile and install piping offsets.
- J. Install guards on sprinklers exposed to potential damage.
- K. Install air compressor on vibration isolators.
- L. Provide drains at system low points.
- M. Hydrostatically test entire system.
- N. Test must be witnessed by Authority having jurisdiction.

3.2 CLEANING

- A. Flush entire piping system of foreign matter.

3.3 PROTECTION OF INSTALLED CONSTRUCTION

- A. Apply masking tape or paper cover to protect concealed sprinklers, cover plates, and sprinkler escutcheons not receiving field paint finish. Remove after painting. Replace painted sprinklers with new.

END OF SECTION

SECTION 22 00 00 - PLUMBING GENERAL CONDITIONS

PART 1 **GENERAL**

1.1 GENERAL REQUIREMENTS

1.2 SUMMARY

- A. Provide labor, materials and appliances necessary for satisfactory installation of mechanical work ready to operate in strict accordance with these specifications and drawings. Work of Division 22 includes, but is not limited to, that as delineated in the following specification sections:

22 00 00	Plumbing General Conditions
22 05 00	Common Work Results for Plumbing
22 07 00	Plumbing Insulation
22 08 00	Project Commissioning (by Commissioning Agent)
22 11 00	Facility Water Distribution
22 13 00	Facility Sanitary Sewerage
22 14 00	Facility Storm Drainage
22 23 00	Natural-Gas Systems
22 30 00	Plumbing Equipment
22 40 00	Plumbing Fixtures

- B. TEST AND BALANCE: Provided by 23 05 93. Provide all necessary coordination, assistance and documentation.

1.3 CODES AND STANDARDS

- A. Conform to following code and agency requirements having jurisdictional authority over mechanical installations.
1. Uniform Plumbing Code (UPC) with local amendments.
 2. International Mechanical Code (IMC) with local amendments.
 3. International Building Code (IBC) with local amendments.
 4. International Fuel Gas Code (IFGC) with local amendments.
 5. National Electrical Code (NEC) NFPA 70.
 6. Requirements of OSHA and EPA.
 7. National Fire Protection Association (NFPA) Codes and Standards.
 8. ASME code for construction of pressure vessels.
 9. American Gas Association (AGA) Standards.
 10. ASTM, ANSI and NEMA standards, as referenced in subsequent sections.
 11. Local Sewer District Requirements.
 12. Local Water District Requirements.
 13. Local Health Department Requirements.

14. Washington State Energy Code.

1.4 PERFORMANCE REQUIREMENTS

- A. Firestopping: Conform to International Building Code with local amendments, FM and UL for fire resistance ratings and surface burning characteristics.
- B. Provide vibration isolation on motor driven equipment 0.5 hp or more, plus connected piping.
- C. Provide minimum static deflection of isolators for equipment as follows:
 - 1. 5 hp and less: 1 inch
- D. Maintain rooms below the maximum sound levels, as defined by ASHRAE Handbook *HVAC Applications* and ANSI S1.8.

1.5 PRODUCT SUBSTITUTIONS:

- A. Manufacturers and models of equipment and material indicated herein and on drawings are those upon which mechanical design is based. Other manufacturers with products considered equal in general quality may be listed without specific model designation. Manufacturers not listed must be submitted for approval.
- B. Substitutions will be evaluated based on product manufacturer only. Specific product model, specifications, options and accessories will be evaluated during submittals. Approval of a manufacturer substitution does not constitute approval of the submitted product.
- C. Any equipment other than the basis of design is considered a substitution.
- D. In selecting substitute equipment, the Contractor is responsible for and must guarantee equal performance and fit. Cost of redesign and all additional costs incurred to accommodate the substituted equipment shall be borne by the Contractor.
- E. Unless indicated otherwise, "or approved" may be assumed for all products in Division 22.

1.6 SUBMITTALS

- A. Provide one electronic copy of product data submittals for all products listed under "Part 2 Products" of Division 22 and all additional products noted on drawings or required for completion of sequence of operations.
- B. Electronic: **All sections of Division 22 shall be submitted together in one complete PDF file with bookmarks for each section. Multi-part submittals will be returned without review.**
 - 1. First Page: Name of Project, Owner, Location & Contracting Company.
 - 2. Index Page: List of specification sections with contents by Tag or item.
 - 3. Bookmarks: Electronic bookmark of each specification section corresponding to listing in index.
- C. Clearly indicate on each page the equipment schedule designation (Tag) and/or specification section, as applicable. Indicate selected model and all accessories intended for use.

- D. Equipment vendor cover page with contact information shall precede submittal by that vendor.
- E. Submitted product information shall include (as applicable) but not be limited to the following information:
 - 1. Product description
 - 2. Manufacturer and model
 - 3. Dimensions
 - 4. Performance Ratings (i.e. capacity, rpm, HP, temperature)
 - 5. Construction Materials
 - 6. Ratings (i.e. UL, ASTM, NEMA, etc)
 - 7. Electrical data
 - 8. Sound level data (corresponding to scheduled values)
 - 9. Vibration Isolation
 - 10. Controls and wiring diagrams
 - 11. Accessories
 - 12. Engineering technical data (i.e. pressure drops, leakage rates, pump curves)
- F. If requested by Architect or Engineer, submit Manufacturer's Installation Instructions on any equipment, procedures, or certifications so requested.
- G. Do no ordering, fabrication or manufacturing of products until return of approved submittals.

1.7 SHOP DRAWINGS

- A. Plumbing Shop Drawings: Submit PDF copies of shop drawings for approval prior to beginning work, drawn to scale not smaller than 1/8 inch equals 1 foot, including but not limited to:
 - 1. All products, systems, and system components.
 - 2. All pipe sizes.
 - 3. All elbows, offsets, and turns clearly identified.
 - 4. Indicate all relevant pipe, ceiling, and structural elevations and clearances.
 - 5. All required valves.
 - 6. Special supports which are not a standard catalog product and which may be fabricated for the Contractor or by the Contractor.
 - 7. Piping system schematic with electrical and connection requirements.
 - 8. Mounting and installation details.
 - 9. General layout of control and alarm panels.
 - 10. Heat exchanger dimensions, size of taps, and performance data.
 - 11. Dimensions of tanks, tank lining methods, anchors, attachments, lifting points, taps, and drains.
 - 12. Locations of access doors.
 - 13. Flexible connectors, expansion joints, loops, offsets, and swing joints.
 - 14. Weights of equipment.
 - 15. Placement and location of openings, holes, or manholes.
 - 16. Equipment substitutions and where installation will differ from design drawings.
- B. The Contractor shall also submit drawings and/or diagrams for review and for job coordination in all cases where deviation from the Contract Drawings are contemplated because of job conditions, interference or substitution of equipment, or when requested by the Engineer for purposes of clarification of the Contractor's intent. Also submit detailed drawings, rough-in sheets, etc., for all special or custom-built items or

equipment. Drawings and details under the section shall include (but not be limited to) the following, where applicable to this project:

1. Electrical interlock wiring diagrams.
 2. Piping layout plans and interference details.
 3. Custom sink layout.
- C. By submission of plumbing shop drawings, the Contractor acknowledges that coordination has been done to ensure that all piping fits and no conflicts exist.
- D. The Architect's review of shop drawings shall not relieve the Contractor of responsibility for deviations from the Contract drawings or specifications, unless he has, in writing, called the attention of the Architect to such deviations at the time of the submission, nor shall it relieve him from responsibility for errors or omission in such shop drawings.

1.8 COMMISSIONING

- A. See Division 01 and Section 22 08 00 for roles and responsibilities of commissioning.
- B. Provide all necessary commissioning assistance, equipment and documentation as required by the Commissioning Plan.
- C. The duty and responsibility for all Division 22 commissioning work shall be assigned to a specific individual. Inform the General Contractor, Commissioning Professional (CCXP) of the contact information for the person so assigned.
- D. Perform corrective actions needed to resolve deficiencies identified during commissioning. Record action taken on commissioning deficiency log.

1.9 PLUMBING PERMIT

- A. Plumbing contractor shall prepare all documents for additional required permit application(s), submit for and obtain the permit(s). All costs and fees to obtain the permit(s) shall be paid by the Plumbing Contractor. Additional permit(s) may include but are not limited to:
1. Mechanical permit for Heat Pump Water Heater Equipment.
 2. Pressure Vessel permit for Hot Water Storage Tanks.
- B. Contractor shall not commence work until permit is obtained. Contractor is solely responsible to insure that the permit application and any revisions are submitted in a timely manner so as not to impact project schedule.

1.10 QUALITY ASSURANCE

- A. Perform Work in accordance with ASME B31.9 – Building Services Piping for installation of piping systems and ASME Section IX – Welding and Brazing Qualifications for welding materials and procedures.
- B. Perform Work in accordance with the Uniform Plumbing Code including State and local amendments.
- C. Provide products requiring electrical connections listed and classified by UL as suitable for purpose specified and indicated.
- D. Perform Work in accordance with Washington State Energy Code.

1.11 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years' experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years' experience.

1.12 SEQUENCING

- A. Sequence balancing between completion of systems tested and Date of Substantial Completion.

1.13 DELIVERY, STORAGE, AND HANDLING

- A. Accept materials on site in original factory packaging, labeled with manufacturer's identification.
- B. Protect all equipment, materials, and insulation from weather, construction traffic, dirt, water, chemicals, and damage by storing in original packaging and under cover. Where original packaging is insufficient, provide additional protection. Maintain protection in place until installation.
- C. Inspect all products and materials for damage prior to installation.
- D. Protect piping from all entry of foreign materials by providing temporary end caps or closures on piping and fittings. Furnish temporary protective coating on cast iron and steel valves.
- E. Protect heat exchangers and tanks with temporary inlet and outlet caps. Maintain caps in place until installation.
- F. Protect materials and finishes during handling and installation to prevent damage.
- G. Comply with manufacturer's installation instruction for rigging, unloading and transporting units.
- H. Protect installed fixtures from damage by securing areas and by leaving factory packaging in place to protect fixtures and prevent use.

1.14 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply fire stopping materials when temperature of substrate material and ambient air is below 60 degrees F. Maintain this minimum temperature before, during, and for minimum 3 days after installation of fire stopping materials.
- B. Provide ventilation in areas to receive solvent cured materials.
- C. Do not install underground piping or valves when bedding is wet or frozen.
- D. Install insulation only when ambient temperature and humidity conditions are within range recommended by manufacturer. Maintain temperature during and after installation for minimum period of 24 hours.

- E. Do not install instruments when areas are under construction, except rough in, taps, supports and test plugs.

1.15 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.
- B. Verify by field measurements, sizes and configurations are compatible with wall construction and layout.
- C. Existing systems and utility lines indicated on drawings are in accordance with information furnished to the Architect and may not be complete. Contractor is responsible for locating, uncovering, disposing of or maintaining existing systems.

1.16 COORDINATION

- A. Visit the site and become familiar with existing conditions affecting work.
- B. Verify locations of any overhead or buried utilities on or near site. Determine such locations in conjunction with all public and private utility companies and with all authorities having jurisdiction.
- C. Existing systems and utility lines indicated on drawings are in accordance with information furnished to the Architect and may not be complete. Contractor is responsible for locating, uncovering, disposing of or maintaining existing systems.
- D. Plumbing drawings are diagrammatic and do not indicate all possible site conditions. The contractor shall verify all measurements, dimensions and connections on site and coordinate between trades to preclude interferences. The contractor shall provide adjustments to piping as necessary to fit conditions including but is not limited to relocation, offsets, and transitions.
- E. In the event of a conflict with other trades of work, the following priority from highest to lowest shall be followed: Structural, lighting, HVAC, plumbing/piping and sprinklers. Starting with the lowest priority, the HVAC, plumbing, and sprinkler contractors shall provide whatever materials, offsets, labor etc. is required to resolve the conflict.
- F. When discrepancies occur between plans and specifications, the Architect will determine which takes precedence and the Contractor shall perform the selected requirement at no additional cost.
- G. Prior to ordering equipment cross-check plumbing and electrical drawings and specifications to assure proper location and electrical characteristics of connections serving mechanical and electrical equipment.
- H. Advise the Architect of any modifications required to suit equipment furnished. Costs for modifications due to equipment substitution will be borne by the contractor.
- I. Wherever conflicts occur between different parts of the Contract Documents the greater quantity, the better quality, or larger size shall prevail unless the Architect informs the Contractor otherwise in writing.
- J. The scale of each drawing is relatively accurate, but the Contractor is warned to obtain the necessary dimensions for any exact takeoffs from the Architect. No additional cost to

the Owner will be considered for failure to obtain exact dimensions where not clear or in error on the drawings. Any device or fixture roughed in improperly and not positioned on implied centerlines or as required by good practice must be repositioned at no cost to the Owner.

- K. Where the word 'verify' is used on the documents, the contractor shall field verify the existing conditions and modify the scope of the installation as required to meet the verified conditions without additional cost to the Owner.
- L. Coordinate trenching, excavating, bedding, backfilling of buried systems with requirements of this specification.
- M. Coordinate wall openings, piping rough-in locations, concrete housekeeping pads, and electrical rough-in locations to accommodate Work of this Section.

1.17 CUTTING, FITTING, REPAIRING AND PATCHING

- A. Arrange and pay for all cutting, fitting, repairing, patching and finishing of work by other trades where necessary for installation of plumbing work. Perform work only with craftsmen skilled in their respective trades.
- B. Avoid cutting, where possible, by setting sleeves, frames, etc., and by coordinating for openings in advance. Assist other trades in securing correct location and placement of rough-frames, sleeves, openings, etc. for piping.
- C. Cut all holes neatly and as small as possible to admit work. Perform cutting in manner so as not to weaken walls, partitions or floors. Drill holes required to be cut in floors without breaking out around holes.

1.18 SALVAGE

- A. Remove excess piping and plug or cap any unused branch connections. Remove scrap pipe and all other excess materials from the site.
- B. Comply with contractor's Construction Waste Management Plan

1.19 ELECTRICAL

- A. Motors:
 - 1. Temperature Rating: Rated for 40 degree C environment with maximum 50 degree C temperature rise for continuous duty at full load.
 - 2. Starting Capability: Not less than 12 starts per hour.
 - 3. Phase Characteristics: Squirrel-cage induction poly-phase motors for 3/4 HP and larger, and capacitor-start single-phase motors for 1/2 HP and smaller. At equipment manufacturer's option, 1/6 HP and smaller may be split-phase type.
 - 4. Service Factor: 1.15 for polyphase motors and 1.35 for single-phase motors.
 - 5. Enclosure Type: Open drip-proof motors for indoor use where satisfactorily housed or remotely located during operation, and guarded drip-proof motors where exposed to contact by employees or building occupants. Weather-protected Type I for outdoor use, Type II, where not housed.
 - 6. Overload Protection: Built-in thermal overload protection.
 - 7. Name Plate: Indicate full identification of manufacturer, ratings, characteristics, construction, special features and similar information.

8. All motor efficiencies shall conform to Washington State Energy Code and NEMA MG-1.
 - B. Motor Starters: By plumbing equipment manufacturer where factory mounted controls are provided. Variable frequency drives by Division 22, all other starters provided by Electrical Contractor.
 - C. Power Wiring: By Electrical Contractor.
 - D. Control Wiring: Responsibility of Division 22, including all line and low voltage control wiring. Owner will not entertain additional cost due to lack of coordination between Plumbing Contractor and Electrical Contractor.
- 1.20 EXTRA MATERIALS
- A. Furnish one set of mechanical seals for each pump where such seals exist.
- 1.21 PROJECT CLOSEOUT
- A. Completion, submission and approval of the following is required for final project closeout.
 1. Execution of Architect's and Engineer's final observation reports (punchlist)
 2. Operating and Maintenance Instructions
 3. Operating and Maintenance Manual
 4. Equipment and Pipe Cleaning
 5. Record Drawings
 6. Testing
 7. Commissioning
 8. Warranty
 - B. See Division 01 for additional requirements.
- 1.22 OPERATING AND MAINTENANCE INSTRUCTIONS
- A. General: In addition to requirements of Division 01, following initial operation of plumbing systems and prior to acceptance by the Architect, perform the following services.
 - B. At least two weeks prior to each instruction period, give written notification of readiness to proceed to the Architect and Owner, and obtain mutually acceptable dates.
 - C. Conduct demonstrations and instructions for the Owner's representatives, pointing out requirements for operating, servicing and maintaining equipment and systems. Describe general system operation and specific equipment functions. Cover all equipment calibration, setpoint adjustment, safeties and alarms.
 - D. Furnish qualifications of Contractor's personnel in charge of the instruction; foreman position is minimum acceptable. Where equipment startup is performed by supplier's or manufacturer's personnel, those personnel should also provide training on that equipment.
 - E. During demonstrations and instructions include and reference information from maintenance manuals and contract drawings.
 1. Provide documentation of all instruction which includes:
 - a. Date and time of instruction

- b. Name, affiliation and qualifications of the instructor
- c. Name and affiliation of the attendees
- d. Topics, systems, and equipment covered
- e. Length of instruction

- F. Minimum duration of instruction periods:
 - 1. Plumbing Systems TBD

1.23 OPERATING AND MAINTENANCE MANUALS

- A. Contents: Furnish, in accord with Division 1, one PDF and one bound copy of operating and maintenance manuals to include the following:
 - 1. Manufacturers, suppliers, contractor names, addresses and phone numbers.
 - 2. Warranty service contractors' names, address and phone numbers (if different from above).
 - 3. Schedule and description of routine maintenance for each component to include oiling, lubrication and greasing data.
 - 4. Test data log.
 - 5. Manufacturer's cuts and rating tables, including brochures for all submittal items.
 - 6. Part numbers of all replaceable items.
 - 7. Control diagrams and operation sequence.
 - 8. Written guarantees.
 - 9. Record drawings corrected and completed.
 - 10. Completed equipment start-up forms and checklists.
- B. Operation and Maintenance Data:
 - 1. Submit frequency of treatment required for interceptors. Include, spare parts lists, exploded assembly views for pumps and equipment.
 - 2. Submit fixture, trim, exploded view and replacement parts lists.
 - 3. Submit replacement part numbers and availability, and nearest service depot location and telephone number.
- C. Binders:
 - 1. Furnish typewritten or printed index and tabbed dividers between principal categories.
 - 2. Bind each manual in a hard-backed loose-leaf binder.
- D. Imprint on cover:
 - 1. Name of project.
 - 2. Owner.
 - 3. Location of project.
 - 4. Architect.
 - 5. Contractor.
 - 6. Year of completion.
- E. Imprint on backing:
 - 1. Name of project.
 - 2. Year of completion.
- F. Submittals:
 - 1. Preliminary Copies: Prior to scheduled completion of the project, submit one PDF copy for review by the Architect.
 - 2. Final Copies: After approval of the preliminary copy, submit one PDF and one bound copy to the Owner.

1.24 EQUIPMENT AND PIPE CLEANING

- A. Clean interior and exterior of all equipment. Equipment shall be free of dirt, construction debris, corrosion, etc.
- B. Adequate provisions shall be made during construction to eliminate dirt, debris or other material from entering and collecting inside of pipe and equipment. Any collection of material shall be thoroughly cleaned before equipment startup and if necessary again before owner occupancy.
- C. Clean exterior of all exposed pipe and equipment.

1.25 RECORD DRAWINGS

- A. Submit one digital file with all drawings in PDF format.
- B. Show location of equipment, location and size of piping. Locate all valves and similar equipment with tag or label identification. Indicate locations and elevations of exterior pipe and utility connections. Maintain continuously updated drawings during progress of project.
- C. Record actual locations of equipment, clean-outs, controlling devices, and all above grade, under-floor, and buried piping.

1.26 TESTING

- A. Provide completed start-up forms and checklists.
- B. Coordinate Test and Balance with Division 23 05 93. Provide all necessary assistance and documentation.

1.27 WARRANTIES AND CONTRACTOR'S GUARANTEE

- A. All work, material and equipment shall be free of defect, complete and in perfect operating order at time of delivery to Owner.
- B. Furnish one year warranty from date of substantial completion for all systems unless specifically noted otherwise.
- C. Without cost to Owner, **correct all defects and failures discovered within one year from date of final acceptance**, except when in the opinion of the Architect a failure is due to neglect or carelessness of the Owner.
- D. The guarantee of the Contractor is independent of shorter time limits by any manufacturer of equipment furnished. Submit with Operation and Maintenance Manual all guarantees that exceed one year (e.g.: water heaters).
- E. Make all necessary balancing and control adjustments during first year of operation.
- F. The presence of any inspector or observer during any construction does not relieve the Contractor from responsibility for defects discovered after completion of the work.

PART 2 **NOT USED**

PART 3 **EXECUTION**

3.1 DOCUMENTATION

- A. Additional plan submittals to reviewing authority: If additional drawing submittals are required at any time during construction contractor shall submit drawings, review with authority, and pick up subsequent approved drawings. Engineer will revise and/or prepare drawings for submittal.

3.2 INSPECTION

- A. Do not allow any work to be covered up or enclosed until inspected, tested and approved by the Architect and all authorities having jurisdiction over the work.
- B. Should any work be enclosed or covered up before such inspection and test, Contractor shall at his own expense uncover work, and after it has been inspected, tested and approved, make all repairs as necessary to restore all work disturbed by him to its original condition.

3.3 FIELD QUALITY CONTROL

- A. Inspect installed fire stopping for compliance with specifications and submitted schedule.
- B. Inspect isolated equipment after installation for proper movement clearance.
- C. Test domestic water piping system in accordance with applicable code and local authority having jurisdiction.
- D. Test sanitary waste and vent piping system in accordance with applicable code and local authority having jurisdiction.
- E. Test storm drainage piping system in accordance with applicable code and local authority having jurisdiction.

3.4 CLEANING

- A. Clean adjacent surfaces of fire stopping materials.
- B. Clean plumbing fixtures and equipment.
- C. Use acceptable cleaning products per IAQ Management Plan.

3.5 MANUFACTURER'S FIELD SERVICES

- A. Where PEX tubing or seismic joints are installed, furnish inspection services by manufacturer's representative and certify installation is in accordance with manufacturer's recommendations and equipment is performing satisfactorily.

3.6 PROTECTION OF FINISHED WORK

- A. Protect adjacent surfaces from damage by material installation.

- B. Do not permit use of plumbing fixtures before final acceptance.

END OF SECTION

SECTION 22 05 00 - COMMON WORK RESULTS FOR PLUMBING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. General Plumbing Valves.
 - 2. Hangers and Supports.
 - 3. Expansion Fittings and Loops.
 - 4. Vibration and Seismic Controls.
 - 5. Firestopping.
 - 6. Access Panels
 - 7. Tags and Identification.
 - 8. Execution

1.2 GENERAL REQUIREMENTS

- A. Comply with requirements and recommendations of Manufacturers Standardization Society of the Valve and Fittings Industry (MSS) Standards SP-58 and SP-69.
- B. Comply with Federal "Reduction of Lead in Drinking Water Act" – 2011. Pipes, pipe fittings, plumbing fittings and fixtures shall be "Lead Free" meaning not more than a weighted average of 0.25% lead in wetted surfaces.

1.3 SCOPE

- A. This section includes products, assemblies and methods applicable to more than one of the systems specified in the following sections of Division 22.

1.4 MATERIALS AND EQUIPMENT

- A. Where two or more units of same class of equipment are required, use products of a single manufacturer. All equipment shall be new and free from damage.
- B. Provide major equipment components with manufacturer's name, address, catalog number and capacity indicated on a nameplate, securely affixed in a conspicuous place.
- C. Furnish standard and fabricated hangers and supports complete with necessary inserts, bolts, nuts, rods, washers and other accessories.

1.5 QUALITY ASSURANCE

- A. Installed products shall have surface Burning Characteristics: 25/50 flame spread/smoke developed index when tested in accordance with ASTM E84.
- B. Perform work in accordance with local jurisdiction's requirements and AWS D1.1 for welding hanger and support attachments to building structure.

PART 2 **PRODUCTS**

2.1 GENERAL VALVE REQUIREMENTS

- A. Bronze valves shall be made with dezincification-resistant materials. Bronze valves made with copper alloy (brass) containing more than 15 percent zinc are not permitted. Brass valves are not permitted.
- B. Valve Pressure and Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
- C. Valve Sizes: Same as upstream piping unless otherwise indicated.

2.2 GATE VALVES

- A. Manufacturers: NIBCO or equal by Apollo, Hammond, Milwaukee, Stockham or approved equal.
- B. 4 inches and Smaller: Use ball valve or butterfly valve in lieu of gate valve.

2.3 BALL VALVES

- A. Manufacturers: NIBCO or equal by Apollo, Hammond, Milwaukee, Stockham or approved equal.
- B. 2 inches and Smaller: Lead-Free, NSF-61-8, UPC-IGC-157, MSS SP 110, 600 psi WOG, two piece silicon performance bronze body, bronze trim, bronze ball, full port, PTFE seats, blow-out proof stem, solder or threaded ends with union, lever handle. For insulated piping provide 2" extended handles of non-thermal conductive material. Nibco Model T/S-585-80-LF.

2.4 BUTTERFLY VALVES

- A. Manufacturers: NIBCO or equal by Apollo, Hammond, Milwaukee, Stockham, Victaulic or approved equal.
- B. 2-1/2 inches to 6": Lead-Free, MSS-SP67, 200 psi CWP, lug style ductile iron body, suitable for bidirectional dead-end service at rated pressure without use of downstream flange. Aluminum-bronze disc, molded-in EPDM seat, geometric drive, one-piece stainless steel stem, copper bushing. Lever operated with 10-position throttling plate. For insulated piping provide 2" extended neck. Nibco LD-2000.
- C. 2-1/2 inches to 6": Lead-Free, MSS-SP67, 300 psi CWP, grooved end, coated ductile iron body, suitable for bidirectional dead-end service at rated pressure without use of downstream flange. EPDM encapsulated disc, EPDM O-Ring seal, geometric drive, two-piece stainless steel stem. Lever operated with 10-position throttling plate. For insulated piping provide 2" extended neck. Nibco GD-4765.

2.5 CHECK VALVES

- A. Swing Check Valves:
 - 1. Manufacturers: NIBCO or equal by Apollo, Hammond, Milwaukee, Stockham or approved equal.
 - 2. 2 inches and Smaller: Lead-Free, NSF-61-8, MSS SP 80, 200 psi CWP, silicone performance bronze body and cap, bronze disc with PTFE seat, Y-pattern design, solder or threaded ends. Nibco Model T/S-413-Y-LF.

3. 2-1/2 inches and Larger: Lead-Free, NSF-61-8, MSS SP 71, Class 125, 200 psi CWP, cast iron body, bronze trim, bronze disc and seat, flanged ends. Nibco Model F-910-LF.
- B. Spring Loaded Check Valves:
1. Manufacturers: NIBCO or equal by Apollo, Hammond, Milwaukee, Stockham, Titan or approved equal.
 2. 2 inches and Smaller: Lead-Free, NSF-61-8, MSS SP 80, 250 psi CWP, silicone performance bronze body, in-line spring lift check, silent closing, PTFE disc, integral seat, solder or threaded ends. Nibco Model T/S-480-Y-LF.
 3. 2-1/2 inches and Larger: Lead-Free, NSF-61-8, MSS SP 71, Class 125, 200 psi CWP, wafer style, cast iron body, Buna-N bonded to bronze seat, center guided bronze disc, stainless steel spring and screws, flanged ends. Nibco Model F-910-LF.

2.6 PIPE HANGERS AND SUPPORTS

- A. Provide hangers and supports with incompressible insulation inserts and shields for all piping to be insulated per 220700.
1. Manufacturer: Pipe Shields, INC or approved equal.
 2. Material: Calcium Silicate or Urethane per temperature application.
 3. Thickness: Insert thickness shall match required insulation thickness per 220700.
- B. Plumbing Piping - DWV: Cast-iron or PVC
1. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Carbon steel, adjustable swivel, split ring.
 2. Hangers for Pipe Sizes 2 inches and Larger: Carbon steel, adjustable, clevis.
 3. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
 4. Wall Support for Pipe Sizes 3 inches and Smaller: Cast iron hook.
 5. Wall Support for Pipe Sizes 4 inches and Larger: Welded steel bracket and wrought steel clamp.
 6. Vertical Support: Steel riser clamp.
 7. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
 8. Copper Pipe Support: Copper-plated, carbon-steel adjustable, ring.
- C. Plumbing Piping - Water: Copper
1. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Carbon steel, adjustable swivel, split ring, with rigid insulation inserts.
 2. Hangers for Cold Pipe Sizes 2 inches and Larger: Carbon steel, adjustable, clevis, with rigid insulation inserts and saddle.
 3. Hangers for Hot Pipe Sizes 2 to 4 inches: Carbon steel, adjustable, clevis, with rigid insulation inserts and saddle.
 4. Hangers for Hot Pipe Sizes 6 inches and Larger: Adjustable steel yoke, cast iron roll, double hanger, with rigid insulation inserts and saddle.
 5. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
 6. Multiple or Trapeze Hangers for Hot Pipe Sizes 6 inches and Larger: Steel channels with welded spacers and hanger rods, cast iron roll.
 7. Wall Support for Pipe Sizes 3 inches and Smaller: Cast iron hook.
 8. Wall Support for Pipe Sizes 4 inches and Larger: Welded steel bracket and wrought steel clamp.
 9. Wall Support for Hot Pipe Sizes 6 inches and Larger: Welded steel bracket and wrought steel clamp with adjustable steel yoke and cast iron roll.

10. Vertical Support: Steel riser clamp.
 11. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
 12. Floor Support for Hot Pipe Sizes 4 inches and Smaller: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
 13. Floor Support for Hot Pipe Sizes 6 inches and Larger: Adjustable cast iron roll and stand, steel screws, and concrete pier or steel support.
 14. Copper Pipe Support: Copper-plated, Carbon-steel ring.
- D. Steel Piping: Natural Gas
1. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Carbon steel, adjustable swivel, split ring.
 2. Hangers for Sizes 2 inches and Larger: Carbon steel, adjustable, clevis.
 3. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
 4. Wall Support for Pipe Sizes 3 inches and Smaller: Cast iron hooks.
 5. Wall Support for Pipe Sizes 4 inches and Larger: Welded steel bracket and wrought steel clamp.
 6. Vertical Support: Steel riser clamp.
 7. Floor Support for Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
- E. Secondary Pipe Positioning and Supports:
1. Makeshift, field devised methods of plumbing pipe support, such as with the use of scrap framing materials, are not allowed. Support and positioning of piping shall be by means of engineered methods that comply with IAPMO PS 42-96. Hubbard "HOLDRITE" support systems or approved equal.
 2. For vertical mid-span supports of piping 4" and under, use HOLDRITE Stout Brackets™ with HOLDRITE Stout Clamps or two-hole pipe clamps (MSS Type 26).
 3. For plenum applications use pipe supports that meet ASTM E-84 25/50 standards, such as the HOLDRITE Flame Fighter™ or approved equal.
- 2.7 HANGER ACCESSORIES
- A. Hanger Rods: Mild steel threaded both ends, threaded on one end, or continuous threaded.
- 2.8 INSERTS
- A. Malleable iron case of galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.
- 2.9 ACCESS PANELS
- A. Milcor or approved equal.
 - B. Include an allowance for a minimum of 16 access panels.
 - C. Architectural grade, 16 guage frame and door, painted steel or stainless steel based on application.
 - D. Provide with optional cylinder lock, common key for all panels.

2.10 UNIONS AND FLANGES

- A. Unions for Pipe 2 inches and Smaller:
 - 1. Ferrous Piping: Class 150, 300 psi CWP, malleable iron, threaded.
 - 2. Copper Piping: Class 150, 300 psi CWP, bronze unions.
 - 3. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.
 - 4. PVC Piping: PVC.
 - 5. CPVC Piping: CPVC.
- B. Flanges for Pipe 2-1/2 inches and Larger:
 - 1. Ferrous Piping: Class 150, 300 psi CWP, forged steel, slip-on flanges.
 - 2. Copper Piping: Class 150, 300 psi CWP, slip-on bronze flanges.
 - 3. PVC Piping: PVC flanges.
 - 4. CPVC Piping: CPVC flanges.
 - 5. Gaskets: 1/16 inch thick preformed neoprene gaskets.
- C. PVC Pipe Materials: For connections to equipment and valves with threaded connections, furnish solvent-weld socket to screwed joint adapters and unions, or Schedule 80 threaded PVC pipe (ASTM D2464).

2.11 FLEXIBLE PIPE CONNECTORS

- A. Manufacturers: Metraflex, Mason or approved equal.
- B. Braided Stainless Steel (Pump Connection)
 - 1. 304 Stainless Steel flexible hose, close pitch, annular corrugated.
 - 2. 304 Stainless Steel double braided outer covering.
 - 3. ANSI Class 150 carbon steel flanges or carbon steel male pipe thread.
 - 4. UL listed, ANSI/NSF-61
- C. Victaulic Style flexible couplings may be used in lieu of flexible connectors for vibration isolation at equipment connections. Three (3) couplings, for each connector, shall be placed in close proximity to the source of vibration.

2.12 FLASHING

- A. Metal Flashing: 26 gage galvanized steel.
- B. Metal Counterflashing: 22 gage galvanized steel.
- C. Lead Flashing:
 - 1. Waterproofing: 5 lb./sq. ft sheet lead.
 - 2. Soundproofing: 1 lb./sq. ft sheet lead.
- D. Flexible Flashing: 47 mil thick sheet butyl; compatible with roofing.
- E. Caps: Steel, 22 gage minimum; 16 gage at fire resistant elements.

2.13 SLEEVES

- A. Sleeves for Pipes Through Non-fire Rated Floors: 18 gage galvanized steel.
- B. Sleeves for Pipes Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Steel pipe or 18 gage galvanized steel.

- C. Sealant: Acrylic
 - D. Size large enough to allow for movement due to expansion and to provide for continuous insulation or installation of fire sealant at fire-rated walls. Note that insulation is discontinuous at fire walls.
- 2.14 MECHANICAL SLEEVE SEALS
- A. Manufacturers: Metraflex Metraseal, Thunderline Link-Seal or approved equal.
 - B. Product Description: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.
- 2.15 MECHANICAL FIRESTOPPING SLEEVE SEALS
- A. Manufacturers: Metraflex Metraseal 120 or approved equal.
 - B. Product Description: Modular mechanical type, consisting of interlocking intumescent synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation. UL listed for 2 hour fire protection.
- 2.16 FORMED STEEL CHANNEL
- A. Manufacturers: Allied Tube & Conduit, B-Line Systems, Unistrut or approved equal.
 - B. Product Description: Galvanized 12 gage steel with holes 1-1/2 inches on center.
- 2.17 SUPPORT ACCESSORIES
- A. Pipe Alignment Guides: Two piece welded steel with enamel paint, bolted, with spider to fit standard pipe, frame with four mounting holes, clearance for minimum 1 inch thick insulation, minimum 3 inch travel.
 - B. Swivel Joints: Bronze body, double ball bearing race, field lubricated, with rubber (Buna-N) o-ring seals.
- 2.18 FIRESTOPPING-APPLIED
- A. Manufacturers: RectorSeal, Dow Corning, 3M Fire Protection or approved equal.
 - B. General:
 - 1. Fire stopping materials shall conform to Flame (F) and Temperature (T) ratings as required by applicable building codes and tested by nationally accepted test agencies per ASTM E 814 or UL 1479 fire tests for through penetrations, and ASTM E 1966 or UL 2079 for construction joints, and UL 2307 for perimeter edge joints.
 - 2. Fire stopping material shall be free of asbestos, PCBs, ethylene glycol, and lead.
 - 3. Do not use any product containing solvents or that requires hazardous waste disposal.
 - 4. Fire stopping shall be performed by a contractor trained or approved by firestop manufacturer.
 - 5. Select products with rating not less than rating of wall or floor being penetrated.

- C. Single Source Responsibility: Provide firestop systems for all conditions from a single supplier.
- D. Product Description: Provide Latex caulk/sealant, Silicone caulk/sealant, Intumescent Wrap Strip, Firestop Putty, Firestop Collar or Intumescent Sleeve to meet each specific application and performance requirement.
- E. Primer: Type recommended by firestopping manufacturer for specific substrate surfaces and suitable for required fire ratings.
- F. Installation Accessories: Provide clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.
 - 1. Forming/Damming Materials: Mineral fiberboard, backer rod or other type recommended by Manufacturer's tested system.

2.19 FIRE STOPPING-CAST IN PLACE

- A. Manufacturers: Presealed Systems "Hydro Flame" or approved equal.
- B. Product Description: Factory assembled for use in concrete floors, outer sleeve lined with intumescent strip, radial extended flange, waterstop gasket/mid-body seal.
- C. General: UL listed system with 3 hour fire rating. Watertight, Class 1 with 3 feet head pressure for 72 hours.
- D. Installation: Provide device based upon pipe type, size and concrete thickness. Align with penetration layout and nail in place. Secure cap prior to pouring concrete. Deburr and clean debris from pipe prior to installation. Coat pipe end with compatible lubricant as necessary.

2.20 VIBRATION ISOLATORS

- A. Manufacturers: Mason, Amber Booth or approved equal.
- B. Restrained Closed Spring Isolators:
 - 1. Spring Isolators:
 - a. For Exterior and Humid Areas: Furnish hot dipped galvanized housings and neoprene coated springs.
 - b. Code: Color code springs for load carrying capacity.
 - 2. Type: Closed spring mount with top and bottom housing separated with neoprene rubber stabilizers.
 - 3. Springs: Minimum horizontal stiffness equal to 75 percent vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection.
 - 4. Housings: Incorporate neoprene isolation pad meeting requirements for neoprene pad isolators, and neoprene side stabilizers with minimum 0.25 inch clearance and limit stops.
- C. Spring Hanger:
 - 1. Spring Isolators:
 - a. For Exterior and Humid Areas: Furnish hot dipped galvanized housings and neoprene coated springs.
 - b. Code: Color code springs for load carrying capacity.
 - 2. Springs: Minimum horizontal stiffness equal to 75 percent vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection.
 - 3. Housings: Incorporate [neoprene isolation pad meeting requirements for neoprene pad isolators] [rubber hanger with threaded insert].

4. Misalignment: Capable of 20 degree hanger rod misalignment.
- D. Neoprene Pad Isolators:
1. Rubber or neoprene-waffle pads.
 - a. 30 durometer.
 - b. Minimum 1/2 inch thick.
 - c. Maximum loading 40 psi.
 - d. Height of ribs: not to exceed 0.7 times width.
 2. Configuration: Single layer.
- E. Rubber Mount or Hanger: Molded rubber designed for 0.5 inches deflection with threaded insert.
- F. Glass Fiber Pads: Neoprene jacketed pre-compressed molded glass fiber.
- G. Seismic Snubbers:
1. Type: Non-directional and double acting unit consisting of interlocking steel members restrained by neoprene elements.
 2. Neoprene Elements: Replaceable, minimum of 0.75 inch thick.
 3. Capacity: 4 times load assigned to mount groupings at 0.4 inch deflection.
 4. Attachment Points and Fasteners: Capable of withstanding 3 times rated load capacity of seismic snubber.

2.21 TAGS

- A. Plastic Tags: Laminated three-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 1-1/2 inches high.
- B. Metal Tags: Brass, Aluminum or Stainless Steel with stamped letters; tag size minimum 1-1/2 inches diameter with finished edges. Plain English designations.
- C. Information Tags: Clear plastic with printed "Danger," "Caution," or "Warning" and message; size 3-1/4 x 5-5/8 inches with grommet and self-locking nylon ties.
- D. Tag Chart: Plain English designations so no chart or index is required.

2.22 PIPE MARKERS

- A. Color and Lettering shall conform to ASME A13.1 and UPC. Specific examples are noted in the table below.

Service	Background Color	Letter Color	Legend
Domestic Cold Water	Green	White	DOMESTIC COLD WATER
Domestic Hot Water	Green	White	DOMESTIC HOT WATER

Domestic Recirculation	Green	White	DHW RECIRC
Tempered Domestic Water	Green	White	TEMPERED WATER
Waste	Black	White	SANITARY SEWER
Vent	Black	White	SANITARY VENT
Condensate Drain	Black	White	CONDENSATE
Storm Drainage	Black	White	STORM
Natural Gas	Yellow	Black	NATURAL GAS

- B. Plastic Pipe Markers: Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering. Larger sizes may have maximum sheet size with spring fastener.
- C. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.

2.23 CEILING TACKS

- A. Description: Steel with 3/4 inch diameter color-coded head.
- B. Color code plumbing valves green.

2.24 LOCKOUT DEVICES

- A. Lockout Hasps: Anodized aluminum hasp with erasable label surface; size minimum 7-1/4 x 3 inches.
- B. Valve Lockout Devices: Nylon device preventing access to valve operator, accepting lock shackle.

PART 3 EXECUTION

3.1 EXISTING WORK

- A. Provide access to existing piping and equipment and other installations remaining active and requiring access.
- B. Extend existing piping installations using materials and methods compatible with existing installations.

3.2 SURFACE PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter affecting bond of firestopping material.
- B. Remove incompatible materials affecting bond of adhesives or firestopping.
- C. Install backing or damming materials to arrest liquid material leakage.
- D. Obtain permission from Architect/Engineer before drilling or cutting structural members.
- E. Degrease and clean surfaces to receive adhesive for identification materials.

3.3 INSTALLATION-CLEARANCE

- A. Appliances and equipment shall be accessible for inspection, service, repair and replacement.
- B. A minimum of 36" of clearance shall be provided in front of the control side of appliances and equipment. Provide additional space when required by NEC.

3.4 INSTALLATION - INSERTS

- A. Install inserts for placement in concrete forms.
- B. Install inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
- C. Provide hooked rod to concrete reinforcement section for inserts carrying pipe 4 inches and larger.
- D. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
- E. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut recessed into and grouted flush with slab.

3.5 INSTALLATION – ACCESS PANELS

- A. Furnish access panels for installation at all concealed equipment which requires service, maintenance or adjustment to include but not limited to equipment, valves, open drains, control valves and controls.
- B. Provide location layout and required size for all access panels to general contractor. Layout shall be regular and consistent, maintain a uniform wall panel height of 24" centerline above finished floor, unless noted otherwise.
- C. Provide fire rated access panels where installed in fire rated assembly.
- D. Furnish access panels to general contractor for installation.
- E. Paint installed access panels to match wall or ceiling. Verify that panels are not painted shut.

3.6 INSTALLATION - VALVES

- A. Install valves with stems upright or horizontal, not inverted.
- B. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.
- C. Install 3/4 inch ball valves with cap for drains at main shut-off valves, low points of piping, bases of vertical risers, and at equipment.
- D. Install valves with clearance for installation of insulation and allowing access.
- E. Provide access panels where valves and fittings are not accessible.
- F. Insulate valves according to application in Section 22 07 00.

- G. For installation of valves in domestic water systems refer to Section 22 11 00.

3.7 VALVE APPLICATIONS

- A. Install ball or butterfly valves for shut-off and to isolate equipment, part of systems, or vertical risers.
- B. Install globe valves for throttling, bypass, or manual flow control services.
- C. Install spring loaded check valves on discharge of pumps.

3.8 INSTALLATION - PIPE HANGERS AND SUPPORTS

- A. Support horizontal piping as scheduled.
- B. Install hangers with minimum 1/2 inch space between finished covering and adjacent work.
- C. Place hangers within 12 inches of each horizontal elbow.
- D. Use hangers with 1-1/2 inch minimum vertical adjustment.
- E. Support vertical piping at every floor. Support vertical cast iron pipe at each floor at hub.
- F. Where piping is parallel and at same elevation, provide multiple pipe or trapeze hangers.
- G. Adjust hangers and supports as required to bring system to proper line and grade. Piping shall be plumb with floor and parallel/perpendicular to building structure.
- H. Support riser piping independently of connected horizontal piping.
- I. Provide copper plated hangers and supports for copper piping, or sheet lead packing between pipe and hanger.
- J. Design hangers for pipe movement without disengagement of supported pipe.
- K. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
- L. Provide clearance in hangers and from structure and other equipment for installation of insulation. Insulated piping shall have insulation run continuous through hangers and supports with use of rigid inserts. Insulation shall be glued to both sides of insert at hangers and supports, no insulation gaps are allowed. Refer to Section 22 07 00.
- M. Support of pipe, tubing and equipment shall be accomplished by means of engineered products, specific to each application. Makeshift, field devised methods shall not be allowed.
- N. Support horizontal cast iron pipe adjacent to each hub, with 5 feet maximum spacing between hangers.

3.9 INSTALLATION – SEISMIC CONTROLS

- A. Provide seismic restraints and hangers in compliance with IBC 1613 and ASCE 7.

- B. Seismic Bracing: Follow IBC 1613, ASCE 7, SMACNA Seismic Restraint Manual and the following.
 - 1. Bracing shall be bidder designed to resist seismic loading in accord with Chapter 16 of the International Building Code, ASCE 7 or the SMACNA guideline.
 - 2. Provide seismic calculations as required for $I_p = 1.5$.

3.10 INSTALLATION-PIPING PROTECTION

- A. Provide protective shield plates in concealed locations where piping, other than cast-iron or steel, is installed in studs, joists or rafters. Plates shall be 16 gage steel and cover the pipe area plus 2". Shields may be omitted if piping is more than 1-1/2" from nearest edge of structural member.
- B. Prevent contact between dissimilar metals, such as copper tubing and steel, by use of copper-plated, plastic coated, or flexible materials. All supports which contact copper tubing shall be copper plated.

3.11 INSTALLATION - EQUIPMENT BASES AND SUPPORTS

- A. Provide housekeeping pads of concrete, minimum 4 inches thick and extending 6 inches beyond supported equipment.
- B. Using templates furnished with equipment, install anchor bolts, and accessories for mounting and anchoring equipment.
- C. Construct supports of steel members, formed steel channel or steel pipe and fittings. Brace and fasten with flanges bolted to structure.
- D. Provide rigid anchors for pipes after vibration isolation components are installed.
- E. When water heaters and similar equipment are installed in a suspended application, an engineered and manufactured platform, such as the Hubbard Enterprises/HOLDRITE Suspended Water Heater Platform shall be used. Weight loading capability shall include a minimum safety factor of 2.

3.12 INSTALLATION - FLASHING

- A. Provide flexible flashing and metal counterflashing where piping penetrates weather or waterproofed walls, floors, and roofs.
- B. Provide acoustical lead flashing around pipes penetrating equipment rooms for sound control.
- C. Flash vent and soil pipes projecting 3 inches minimum above finished roof surface with lead worked 1 inch minimum into hub, 8 inches minimum clear on sides with 24 x 24 inches sheet size. For pipes through outside walls, turn flanges back into wall and caulk, metal counter-flash, and seal.
- D. Flash floor drains in floors with topping over finished areas with lead, 10 inches clear on sides with minimum 36 x 36 inch sheet size. Fasten flashing to drain clamp device.
- E. Seal drains watertight to adjacent materials.
- F. Adjust storm collars tight to pipe with bolts; caulk around top edge. Use storm collars above roof jacks. Screw vertical flange section to face of curb.

3.13 INSTALLATION - SLEEVES

- A. Exterior watertight entries: Seal with mechanical sleeve seals.
- B. Set sleeves in position in forms. Provide reinforcing around sleeves.
- C. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- D. Extend sleeves through floors 1 inch above finished floor level. Caulk sleeves.
- E. Where piping penetrates floor, ceiling, or wall, close off space between pipe and adjacent work with insulation and caulk or fireproof airtight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.

3.14 INSTALLATION – FIRESTOPPING AND SEALS AT PARTITIONS

- A. Install material at fire rated construction perimeters and openings containing penetrating sleeves, piping and other items requiring firestopping.
- B. Apply primer where recommended by manufacturer for type of firestopping material and substrate involved, and as required for compliance with required fire ratings.
- C. Apply firestopping material in sufficient thickness to achieve required fire and smoke rating and to uniform density and texture. Remove dam material after firestopping material has cured.
- D. Place foamed material in layers to ensure homogenous density, filling cavities and spaces. Place sealant to completely seal junctions with adjacent dissimilar materials.
- E. Place intumescent coating in sufficient coats to achieve rating required.
- F. Clean adjacent surfaces of firestopping materials.
- G. Fire Rated Surface:
 - 1. Seal opening at floor, wall, partition, ceiling, and/or roof as follows:
 - a. Install sleeve through opening and extending beyond minimum of 1 inch on both sides of building element.
 - b. Size sleeve allowing minimum of 1 inch void between sleeve and building element.
 - c. Pack void with backing material.
 - d. Seal ends of sleeve with UL listed fire resistive silicone compound to meet fire rating of structure penetrated.
- H. Non-Rated Surfaces:
 - 1. Seal opening through non-fire rated wall, partition, floor, ceiling, and/or roof opening as follows:
 - a. Install sleeve through opening and extending beyond minimum of 1 inch on both sides of building element.
 - b. Size sleeve allowing minimum of 1 inch void between sleeve and building element.
 - 2. Install escutcheons where piping penetrates non-fire rated surfaces in occupied spaces.
 - 3. Exterior wall openings below grade: Assemble rubber links of mechanical sealing device to size of piping and tighten in place, in accordance with manufacturer's instructions.

4. Interior partitions: Seal pipe penetrations air tight. Apply sealant to both sides of penetration to completely fill annular space between sleeve and conduit.

3.15 INSTALLATION – VIBRATION ISOLATION

- A. Install isolation for motor driven equipment.
- B. Install flexible pipe connectors on pipes connected to equipment supported by vibration isolation. Provide line size flexible connectors.
- C. Install flexible connectors at right angles to displacement. Install one end immediately adjacent to isolated equipment and anchor other ends. Install in horizontal plane unless indicated otherwise.
- D. Provide grooved piping systems with minimum of three flexible couplings instead of flexible connector supported by vibration isolation.
- E. Adjust equipment level.
- F. Install spring hangers without binding.
- G. On closed spring isolators, adjust so side stabilizers are clear under normal operating conditions.
- H. Prior to making piping connections to equipment with operating weights substantially different from installed weights, block up equipment with temporary shims to final height. When full load is applied, adjust isolators to load to allow shim removal.
- I. Provide resiliently mounted equipment and piping with seismic snubbers. Provide each inertia base with minimum of four seismic snubbers located close to isolators. Snub equipment designated for post disaster use to 0.05 inch maximum clearance. Provide other snubbers with clearance between 0.15 inch and 0.25 inch.
- J. Support piping connections to isolated equipment resiliently to nearest flexible pipe connector or as follows:
 1. Up to 4 inch Diameter: First three points of support.
 2. 5 to 8 inch Diameter: First four points of support.
 3. 10 inch Diameter and Over: First six points of support.
 4. Select three hangers closest to vibration source for minimum 1.0 inch static deflection or static deflection of isolated equipment. Select remaining isolators for minimum 1.0 inch static deflection or 1/2 static deflection of isolated equipment.

3.16 INSTALLATION – EXPANSION FITTINGS AND LOOPS

- A. Provide support and anchors for controlling contraction of piping. Provide loops, pipe offsets, and swing joints, or expansion joints where required.
- B. Install Work in accordance with ASME B31.9.
- C. Rigidly anchor pipe to building structure. Provide pipe guides to direct movement only along axis of pipe. Erect piping so strain and weight is not on cast connections or apparatus.
- D. Provide expansion loops as indicated in Drawings.

3.17 INSTALLATION - IDENTIFICATION

- A. Install identifying devices after completion of coverings and painting.
- B. Install plastic nameplates with corrosive-resistant mechanical fasteners, or adhesive.
- C. Install labels with sufficient adhesive for permanent adhesion and seal with clear lacquer. For unfinished canvas covering, apply paint primer before applying labels.
- D. Identify nonpotable water outlets with plastic permanent mounted sign in uppercase lettering which reads, "CAUTION: NONPOTABLE WATER, DO NOT DRINK." Signage shall be black lettering on yellow background.
- E. Nameplates: Identify plumbing equipment (water heaters, pumps, heat transfer equipment, tanks, and water treatment devices) with plastic nameplates.
 - 1. Identify in-line pumps and other small devices with name tags.
 - 2. Identify control panels and major control components outside panels with plastic nameplates.
 - 3. Identify description should be as numbered on drawings or plain English description. i.e. "WH-1" or "Rain Water Storage Tank".
 - 4. Label automatic controls, instruments, and relays. Key to control schematic.
 - 5. Label wall controls and switches with associated equipment designation and control function, i.e. "DCP, Timer".
- F. Valve Tags: Identify valves in main and branch piping with tags.
 - 1. Do not provide numbered tags.
 - 2. Provide tags with plain English description of service and function. i.e. "Domestic Hot Water, Kitchen"
- G. Pipe Labels: Identify piping, concealed or exposed, with plastic tape pipe markers.
 - 1. Identify service, flow direction, and pressure.
 - 2. Install in clear view and align with axis of piping.
 - 3. Locate identification on straight runs including risers and drops with spacing not to exceed 20 feet.
 - 4. Locate adjacent to each valve and tee, at each side of penetration of structure or enclosure, and at each obstruction.
- H. Provide ceiling tacks to locate valves above T-bar type panel ceilings. Locate in corner of panel closest to equipment.
- I. Equipment and Valve Tag Index: Plain English designations so no chart or index is required.

3.18 PROTECTION OF FINISHED WORK

- A. Protect adjacent surfaces from damage by firestopping material installation.

3.19 SCHEDULES

- A. Pipe Hanger Spacing

PIPE MATERIAL	MAXIMUM HANGER SPACING (Feet)	HANGER ROD DIAMETER (Inches)
ABS (All sizes)	4	3/8

Aluminum (All sizes)	10	1/2
Cast Iron (All Sizes)	5	3/8
Cast Iron (All Sizes) with 10 foot length of pipe	10	3/8
CPVC, 1 inch and smaller	3	1/2
CPVC, 1-1/4 inches and larger	4	1/2
Copper Tube, 1-1/4 inches and smaller	6	1/2
Copper Tube, 1-1/2 inches and larger	10	1/2
PVC (All Sizes)	4	3/8
Steel, 3 inches and smaller	6	1/2
Steel, 4 inches and larger	12	3/8

B. Pipe Isolation Schedule:

Pipe Size Inch	Isolated Distance from Equipment
1	120 diameters
2	90 diameters
3	80 diameters
4	75 diameters

C. Equipment isolation schedule:

ISOLATED EQUIPMENT	BASE		ISOLATOR	
	TYPE	THICKNESS	TYPE	DEFLECTION
Inline Pumps	N/A	N/A	Braided Flex	
Skid/Base Pumps	Concrete	4"	Braided Flex	
Water Heater			Copper Flex	

END OF SECTION

SECTION 22 07 00 - PLUMBING INSULATION

PART 1 **GENERAL**

1.1 SUMMARY

- A. Section Includes:
 - 1. Piping system insulation.
 - 2. Equipment insulation.
 - 3. Pipe insulation jackets.
 - 4. Equipment insulation jackets.
 - 5. Insulation accessories including vapor retarders and accessories.

1.2 QUALITY ASSURANCE

- A. Provide insulation tested for maximum flame spread index of 25 and maximum smoke developed index of not exceeding 50 in accordance with ASTM E84.
- B. All systems components subject to heat loss or gain, such as, piping, storage tanks, vessels, valves etc. shall be insulated to conform with the Washington State Energy Code (as minimum).

1.3 IDENTIFICATION

- A. Insulation shall bear a manufacturer's mark indicating the product R-value or K-value and thickness. This mark shall be visible after installation and shall be repeated at an interval of no greater than 10 feet.
- B. R-values shall be based on insulation at 75 F mean temperature difference.
- C. For rigid or spray foam the aged R-value per inch shall be provided in submittals.

PART 2 **PRODUCTS**

2.1 GLASS FIBER, RIGID

- A. Manufacturers: Johns Manville Micro-Lok AP-T Plus or equal by Owens-Corning, Knauf, Manson or approved equal.
- B. Insulation: Rigid, noncombustible. ASTM C547.
 - 1. 'K' factor: 0.23 at 75 degrees F.
 - 2. Fiberglass or Earthwool with ECOSE
 - 3. Maximum Service Temperature: 850 degrees F.
 - 4. Maximum Moisture Absorption: 0.2 percent by volume.
 - 5. Density: 3.0 lb/cu ft.
- C. Vapor Retarder Jacket: ASJ+ or Type I, reinforced facing, paintable. Longitudinal acrylic adhesive closure system with factory supplied butt strips. ASTM C1136.
- D. Rigid clamp/hanger insert: Preformed, incompressible (Calcium Silicate or similar), matching pipe size and insulation thickness.

2.2 GLASS FIBER, BLANKET

- A. Manufacturers: Johns Manville Micro-Flex or equal by Owens-Corning, Knauf, Manson or approved equal.
- B. Insulation: Semi-rigid, shot-free, continuous fiber, noncombustible. ASTM C1393.
 - 1. 'K' factor: 0.24 at 75 degrees F.
 - 2. Maximum Service Temperature: 850 degrees F.
 - 3. Maximum Moisture Absorption: 0.2 percent by volume.
 - 4. Density: 2.5 lb/cu ft.
- C. Vapor Retarder Jacket: Type I, reinforced facing, will accept paint. Seal with pressure sensitive tape. ASTM C1136.

2.3 POLYOLEFIN INSULATION

- A. Manufacturers: IMCOA or similar.
- B. Polyolefin or Polyethylene pipe insulation is **NOT ACCEPTABLE** for any application.

2.4 ELASTOMERIC CELLULAR FOAM

- A. Manufacturers: Armacell AP/Armaflex, Aeroflex Aerocel or approved equal.
- B. Preformed flexible, closed-cell, elastomeric thermal insulation: Type I, Tubular form, self-seal or continuous, 25/50-rated, CFC free, low VOC, 'K' factor: 0.27 at 75 degrees F. ASTM C534.
- C. Rigid clamp/hanger insert: Armacell Armafix, polyurethane insert and aluminum jacket, single piece with self-adhering closure.

2.5 PIPE INSULATION AND EQUIPMENT JACKETS

- A. PVC Plastic Pipe Jacket:
 - 1. Product Description: One piece molded type fitting covers and sheet material, off-white color. ASTM D1784.
 - 2. Thickness: 15 mil indoor, 30 mil outdoor.
 - 3. Connections: Brush on welding adhesive.
- B. Canvas Equipment Jacket:
 - 1. Fabric: 6 oz/sq yd, plain weave cotton.
 - 2. Composite of insulation, jacket and laces.
- C. Aluminum Pipe Jacket:
 - 1. Thickness: 0.016 inch thick sheet. ASTM B209.
 - 2. Finish: Embossed
 - 3. Joining: Longitudinal slip joints and 2 inch laps.
 - 4. Fittings: 0.016 inch thick die shaped fitting covers with factory attached protective liner.
 - 5. Metal Jacket Bands: 3/8 inch wide; 0.015 inch thick aluminum.

PART 3 **EXECUTION**

3.1 EXAMINATION

- A. Verify piping and equipment has been tested before applying insulation materials.

- B. Verify surfaces are clean and dry, with foreign material removed.

3.2 INSTALLATION

- A. Apply insulation when building is thoroughly dry to prevent shrinkage.
- B. Exposed Piping: Locate insulation and cover seams in least visible locations.
- C. Insulate entire piping system including fittings, valves, unions, flanges, strainers, flexible connections, pump fittings, connections to equipment and expansion joints. Use canvas jackets for valves and other irregular shapes.
- D. Insulate flanges and unions with removable sections and jackets.
- E. Piping Inserts and Shields:
 - 1. Insulation shall be continuous through supports and hangers with incompressible inserts and shields. Do not directly clamp/support pipe scheduled to be insulated.
 - 2. Shields: Galvanized steel saddle between pipe clevis hangers or pipe rollers and insulation. Minimum 6 inches long, of contour matching adjoining insulation; may be factory fabricated.
 - 3. Inserts: Between pipe clamps, hangers or rollers and piping.
 - 4. Insert material: Compression resistant insulating material suitable for insulation type and planned temperature range and service.
 - 5. Glue insulation to both sides of insert.
 - 6. Shields without inserts may be used at clevis hangers on refrigerant piping 5/8" and smaller with continuous insulation.
- F. Continue insulation through penetrations of building assemblies or portions of assemblies having fire resistance rating of one hour or less. Provide intumescent firestopping when continuing insulation through assembly. Finish at supports, protrusions, and interruptions.
- G. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces: Finish with PVC jacket and fitting covers.
- H. Exterior Piping Applications: Use only elastomeric closed-cell foam insulation. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with sealant. Cover with aluminum jacket with seams located at 3 or 9 o'clock position on side of horizontal piping with overlap facing down to shed water or on bottom side of horizontal equipment.
- I. Exterior Piping Applications: Provide continuous heat trace of piping, joints and valves.
- J. Exposed Equipment: Locate insulation and cover seams in least visible locations.
- K. Apply insulation close to equipment by grooving, scoring, and beveling insulation. Fasten insulation to equipment with studs, pins, clips, adhesive, wires, or bands.
- L. Fill joints, cracks, seams, and depressions with bedding compound to form smooth surface. On cold equipment, use vapor retarder cement.
- M. Finish insulation at supports, protrusions, and interruptions.
- N. Nameplates and ASME Stamps: Bevel and seal insulation around; do not insulate over.
- O. Equipment Requiring Access for Maintenance, Repair, or Cleaning: Install insulation for easy removal and replacement without damage.

3.3 SCHEDULES

A. Piping: Provide on piping as listed below. Exception: In residential units only, the water piping downstream of the submeters can be insulated per the minimum Washington State Energy Code requirements.

Service	Insulation Type	PIPE SIZE			
		<1"	1" to 1-1/4"	1-1/2" to 4"	4" to 8"
Domestic Cold Water	Glass Fiber RIGID	1/2"	1/2"	1/2"	1/2"
Domestic Hot Water Supply	Glass Fiber RIGID	1"	1"	1-1/2"	1-1/2"
Domestic Hot Water Recirc.	Glass Fiber RIGID	1"	1"	1-1/2"	1-1/2"
Tempered Hot Water	Glass Fiber RIGID	1"	1"	1-1/2"	1-1/2"
Domestic water H/C/R/T outside conditioned space	Glass Fiber RIGID	1-1/2"	1-1/2"	2"	2"
Condensate Drains	RIGID / FOAM	1/2"	1/2"	1/2"	1/2"
Roof Drain & Overflow Bowls in conditioned area	Glass Fiber RIGID	1/2"	1/2"	1/2"	1/2"
Rainleader & Overflow Piping in conditioned area	Glass Fiber RIGID	1/2"	1/2"	1/2"	1/2"

1. Do not insulate direct burial rain leader.
2. Do not insulate direct burial cold water.
3. For all exterior piping applications use only Elastomeric Cellular Foam with Aluminum jacket.
4. For all below grade piping application use only insulation specifically engineered for application. (Closed Cell Polyurethane System)

B. Equipment: Provide on equipment as listed below.

Service	Insulation Type	Thickness	Jacket
Hot Water Storage Tank	Glass Fiber BLANKET	4"	Reinforced White-Kraft Paper
Expansion Tank	Glass Fiber BLANKET	2"	Reinforced White-Kraft Paper
Valves, strainers, and other domestic piping accessories	Glass Fiber BLANKET / Cellular FOAM	Per pipe schedule	Canvas bag with wire ties.

END OF SECTION

SECTION 22 11 00 - FACILITY WATER DISTRIBUTION

PART 1 **GENERAL**

1.1 SUMMARY

- A. Section Includes:
 - 1. Domestic water piping.
 - 2. Piping Accessories.
 - 3. Circuit balancing valve.
 - 4. Reduce pressure backflow assembly.
 - 5. Thermostatic mixing valves.

1.2 SCOPE

- A. This section includes hot and cold water supply, equipment and accessories.
- B. This section includes domestic hot and/or cold water consumption metering with data collection and billing software.

1.3 GENERAL REQUIREMENTS

- A. Comply with Federal "Reduction of Lead in Drinking Water Act" – 2011. Pipes, pipe fittings, plumbing fittings and fixtures shall be "Lead Free" meaning not more than a weighted average of 0.25% lead in wetted surfaces.

1.4 SITE MAINS

- A. Provide connections to Site water mains as indicated on drawings.

1.5 QUALITY ASSURANCE

- A. The grooved coupling manufacturer's factory trained representative shall provide on-site training for contractor's field personnel in the use of grooving tools and installation of grooved joint products. The representative shall periodically visit the jobsite and review installation. (A distributor's representative is not considered qualified to conduct the training or jobsite visit(s).)
- B. The mechanical press fitting manufacturer's factory trained representative shall provide on-site training for contractor's field personnel in the use of press fittings and crimping tools. The representative shall periodically visit the jobsite and review installation. (A distributor's representative is not considered qualified to conduct the training or jobsite visit(s).)

PART 2 **PRODUCTS**

2.1 DOMESTIC WATER PIPING, BURIED WITHIN 5 FEET OF BUILDING

- A. Copper Tubing: Type K hard drawn or annealed. ASTM B88.
 - 1. Fittings: ASME B16.22, ASTM B75, wrought copper.
 - 2. Joints: Brazed
 - a. Copper to copper: Silver/phosphorus/copper alloy (15 percent silver). AWS A5.8 BCuP-5.
 - b. Copper to brass or steel: AWS Bag-5 Silver (45 percent silver)

2.2 DOMESTIC WATER PIPING, ABOVE GRADE

- A. Copper Tubing: Type L hard drawn seamless. ASTM B88.
 - 1. Fittings:
 - a. Wrought copper and bronze. ASME B16.22, ASTM B75.
 - b. Copper press with EPDM O-ring, ASME B16.22, 200 psi.
 - 2. Joints:
 - a. Solder, lead free, 95-5 tin-antimony, or tin and silver. ASTM B32.
 - b. Press connection, Viega ProPress or approved equal.

- B. Copper Tubing: Type L hard drawn, rolled grooved ends. ASTM B88.
 - 1. Copper Grooved-End Fittings: ASME B75 copper tube or bronze ASTM B584 bronze castings, with copper tube dimensioned grooved ends (flaring of tube and fitting ends to IPS dimensions is not permitted).
 - 2. Joints: Grooved mechanical couplings meeting ASTM F1476. Victaulic or approved equal.
 - a. Housing Clamps: ASTM A395 and ASTM A536 ductile iron cast with offsetting, angle-pattern bolt pads, copper-colored enamel coated, compatible with copper tubing sizes, to engage and lock designed to permit some angular deflection, contraction, and expansion.
 - b. Gasket: Grade "EHP" EPDM.
 - c. Accessories: Steel bolts, nuts, and washers.
 - d. Design: "Installation Ready" designed for direct 'stab' installation onto roll grooved copper tube without prior field disassembly and no loose parts. Victaulic Style 607 QuickVic™.

- C. CPVC Pipe (2" and larger): Schedule 80 CPVC, Charlotte Corzan or approved equal. ASTM D1784, ASTM F441, NSF 61.
 - 1. Fittings: Schedule 80 CPVC. ASTM F439, NSF 61.
 - 2. Joints: Solvent weld with ASTM F493 two-step solvent cement with primer.

- D. Domestic PEX Pipe: See Section 22 11 16.

2.3 TRAP PRIMER PIPING

- A. Copper Tubing: 1/2" Type L soft annealed seamless, ASTM B88
 - 1. Fittings: Flared compression.

- B. PEX: 1/2" Uponor, Viega or approved equal
 - 1. PEX-a (Engel-Method Crosslinked Polyethylene) Piping: NSF 61, ASTM F 876 and F877.

2.4 PRESSURE GAUGES

- A. Manufacturers: Marsh, Terice, Weiss or approved equal.

- B. Gauge: Rotary stainless steel movement, 316 stainless steel socket, front calibration adjustment, black scale on white background. ASME B40.1. Terice 700.
 - 1. Case: 304 stainless steel
 - 2. Bourdon Tube and wetted parts: 316 stainless steel.
 - 3. Dial Size: 4 inch diameter within 7' of floor, 6 inch diameter over 7'.
 - 4. Mid-Scale Accuracy: 1/2 percent.
 - 5. Scale: PSI.

2.5 PRESSURE GAUGE TAPS

- A. Needle Valve: 316 stainless steel, 1/4 inch NPT for minimum 300 psi. Trerice 735.
- B. Pulsation Damper: 316 stainless steel, 1/4 inch NPT connections. Trerice 870
- C. Pressure Snubber: 316 stainless steel, 1/4 inch NPT connections. Trerice 872
- D. Siphon: 316 stainless steel, 1/4 inch NPT angle or straight pattern. Trerice 885.

2.6 STEM TYPE THERMOMETERS

- A. Manufacturers: Marsh, Trerice, Weiss or approved equal.
- B. Thermometer: Blue appearing organic, lens front tube, cast aluminum case with epoxy finish, adjustable angle. ASTM E1. Trerice AX/BX.
 - 1. Size: 7-inch scale within 7' of floor, 9-inch scale mounted over 7'.
 - 2. Window: Clear.
 - 3. Stem: 304SS, 3/4 inch NPT.
 - 4. Accuracy: 2 percent.
 - 5. Calibration: Degrees F.

2.7 AUTOMATIC FLOW BALANCING VALVE

- A. Manufacturers: Caleffi 127, Nibco Flo-Boss or approved equal.
- B. Construction: Low-lead brass body, anti-scale polymer flow cartridge, stainless steel spring, EPDM seals. 200 psi max working pressure. 200 F max temperature.
- C. Control: Working pressure ranges 2-14 psid or 2-32 psid for flows from 0.5 gpm to 5 gpm.

2.8 STRAINERS

- A. Manufacturers: Apollo/Conbraco, Metraflex, Titan, Nibco or approved equal.
- B. 4 inch and Smaller: Threaded or Solder, 400 PSI CWP, lead-free bronze body, Y-pattern with 20 mesh stainless steel perforated screen. Apollo 59LF.
- C. 5 inch and Larger: Flanged, 200 psi CWP, iron body, epoxy coated, Y-pattern with 3/64 inch stainless steel perforated screen. Apollo 125YF

2.9 REDUCED PRESSURE BACKFLOW PREVENTERS (RPBA)

- A. Manufacturers: Watts or equal by Apollo/Conbraco, Wilkens or approved equal. Must be listed as acceptable by the State of Washington Cross Connection Manual.
- B. 2-1/2 inches and Larger: Lead- Free. Comply with ASSE 1013. 300 stainless steel body with internal pressure differential air-in/water-out relief valve located between two positive seating captured spring check valves, epoxy coated inlet Y-strainer, inlet and outlet epoxy coated gate valves, ball valve test cocks, stainless steel internal parts, replaceable stainless steel seats, air gap drain fitting, 175 psi working pressure, 33-110 F operating temperature range. Watts model 994.

2.10 WATER HAMMER ARRESTORS

- A. Manufacturers: Wade, PPP or approved equal.

- B. ASSE 1010; stainless steel or copper construction, pre-charged, bellows or piston type sized in accordance with PDI WH-201.

2.11 THERMOSTATIC MIXING VALVE (ELECTRONIC)

- A. Manufacturers: Heat-Timer ETV Platinum Plus, equal by Leonard or approved equal.
- B. The control shall operate on 120VAC. The control shall be pre-engineered and programmed for the direct valve actuator operation in a domestic hot water heating system. It shall incorporate the following components:
 - C. Control: A microprocessor Electronic Tempering Valve control with PID-type logic, built-in transformer, digital display of temperature and set point, and LED indicator. It shall be capable of controlling a set point range from 40°F to 200°F. It shall display the valve opening percentage to match actuator percent. The control shall maintain set point temperature within $\pm 2^\circ$ during a domestic draw of 0.5 gpm to full flow capacity in accordance with ASSE 1017.
 - D. Actuator: An actuator/Motor and linkage capable of traveling the complete valve stroke from fully OPEN to fully CLOSE in less than 20 seconds. It shall calibrate to the actual valve stroke. The actuator is also capable of operating in the reverse direction, allowing the interchangeability of the HOT and COLD connections to the valve body.
 - E. Stainless Steel Valve: An NPT threaded 3-way mixing valve with 304 stainless steel body and trim. The maximum operating temperature of the valve shall be 300°F (149°C) with a maximum working pressure of 225 psi.
 - F. Sensor: Temperature sensor of the thermistor type that can measure from -30°F to 250°F.
 - G. Features:
 - 1. The control shall modulate the mixing valve to match the set point.
 - 2. Setpoint: The control shall offer the user the ability to adjust the setpoint using a menu option and it shall display the setpoint at all times on the default screen.
 - 3. Modes of Operation: The control shall operate as an electronic tempering valve with high temp alarm/safeguard.
 - 4. Schedules: The control shall offer the user the ability to set a schedule where the control overrides the setpoint and sets an absolute water temperature. The control shall offer schedules for each day, every day, weekdays only, and weekends only. Up to four periods can be configured per day.
 - 5. Flow Switch: The control shall offer an input that can accept a dry-contact flow switch to detect when no water flow is detected.
 - 6. Auto Calibration: After initial startup calibration, the actuator/motor shall automatically calibrate itself to the valve attached.
 - 7. Multiple Actuator Connection: The control shall be capable of operating multiple valves piped in parallel with a single 0–10Vdc output signal.
 - 8. Display: The control shall have an alphanumeric display. All control operation information shall be available for display.
 - 9. Memory and Backup: The control shall store all configuration and settings on EEPROM. In case of power failure, the control shall be able to retrieve all of its latest settings when power is restored.
 - 10. Sensor Inputs: The control shall be capable of supporting three standard sensor inputs. The sensor inputs shall be of the thermistor type. Thermistor operating temperature range shall be -30°F to 250°F. Should the sensor show a fault condition, the control shall automatically close the hot port of the valve until the

situation is rectified. The sensors shall monitor inlet CW, HW and outlet mixed water temperatures. Locate the CW and HW inlet sensors at least 6 feet from the valve. The CW sensor shall also be downstream of the HWC connection. Locate the mixing outlet sensor between 1 and 3 feet from the valve.

11. Alarm / Safeguard Option: The control shall have a manual reset button that will exit the control from its alarm status. The reset function shall only work when the temperature has dropped below the alarm setpoint. The control will turn on an alarm indicator and energize both alarm relays for optional external alarms. When the alarm is corrected the control is reset.
12. Power Failure: The control shall automatically shut off the flow of hot water in the event of a power failure.

2.12 THERMOSTATIC MIXING VALVES

- A. Manufacturers: Symmons, Lawler, Powers, Acorn or approved equal.
- B. Valve: Lead-Free cast brass body with [rough bronze] [chrome] finish, liquid filled thermal motor with bellows, stainless steel piston, integral temperature adjustment control.
- C. Assembly: Valve and piping assembly with wall mounting bracket, pipe unions, check valve and strainer stop inlets, outlet dial thermometer, outlet ball valve. Factory assembled and tested. Certified to ASSE 1017 standard.

2.13 TEMPERING VALVE (PUBLIC LAV)

- A. Manufacturers: Symmons, Leonard, Powers, Acorn or approved equal.
- B. General: Lead-Free brass and bronze body with brass and stainless steel flow control components with check stops, vandal resistant lockable handle, rough [bronze] [chrome] finish. Certified to ASSE 1070 standard.

PART 3 **EXECUTION**

3.1 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel or groove plain end ferrous pipe.
- B. Remove scale and dirt, on inside and outside, before assembly.
- C. Prepare piping connections to equipment with groove couplings, flanges or unions.
- D. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.

3.2 INSTALLATION - BURIED PIPING SYSTEMS

- A. Verify connection to existing piping system size, location, and invert are as indicated on Drawings.
- B. Provide connections to site mains as indicated on drawings.
- C. Grade piping at 1/4" per foot where possible, but in no case less than 1/8" per foot. Install all main vertical soil and waste stacks with provisions for expansion and extend full size to roof line as vents.

- D. Backfill trenching with pea-gravel if available at site for other purposes. If pea-gravel is unavailable, native soil may be used for backfill if all the following conditions are met.
 - 1. All broken concrete and sharp stones (+1" dia.) to be removed from backfill soil.
 - 2. All large stones (3' dia. or bigger) to be removed from backfill soil.
 - 3. Piping shall be bedded on min. 2" thickness of replaced "rock free" soil and then checked for grade.
- E. Establish elevations of buried piping with not less than 3 ft of cover.
- F. Establish minimum separation from other services piping in accordance with Code.
- G. Route pipe in straight line.
- H. Install pipe to allow for expansion and contraction without stressing pipe or joints.
- I. Install plastic ribbon tape continuous over top of pipe.
- J. Install trace wire continuous over top of pipe.

3.3 INSTALLATION - ABOVE GROUND PIPING

- A. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- B. Install piping to maintain headroom without interfering with use of space or taking more space than necessary.
- C. Group piping whenever practical at common elevations.
- D. Install piping on interior side of building insulation.
- E. Provide heat tape for all piping in unheated areas.
- F. Sleeve pipe passing through partitions, walls and floors.
- G. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- H. Protection: Where piping, other than cast iron or steel, is installed in a concealed location through holes or notches in framing (i.e. studs, joists, rafters, etc.), less than 1-1/2 from framing edge, provide shield plates. Shield plates shall be 16 gauge steel and cover the piping area within framing plus 2" on each side along framing.
- I. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings. Refer to Section 22 07 00.
- J. Grooved Joints: Install in accordance with the manufacturer's (Victaulic) guidelines and recommendations. The gasket style and elastomeric material (grade) shall be verified as suitable for the intended service as specified. Grooved end shall be clean and free from indentations, projections, and roll marks in the area from pipe end to groove for proper gasket sealing. A factory-trained field representative shall provide on-site training for contractor's field personnel in the proper use of grooving tools and installation of grooved piping products. Factory-trained representative shall periodically review the product installation. Contractor shall remove and replace any improperly installed products.
- K. Provide access panel where valves and fittings are not accessible.

- L. Install non-conducting dielectric connections wherever jointing dissimilar metals.
- M. Slope piping and arrange systems to drain at low points. Provide hose bibb if low point is not at a plumbing fixture.
- N. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.
- O. Insulate piping. Refer to Section 22 07 00.
- P. Install pipe identification in accordance with Section 22 05 00.

3.4 INSTALLATION - DOMESTIC WATER PIPING SYSTEMS

- A. Install domestic water piping system in accordance with ASME B31.9.
- B. Grade piping to drain at low points. Provide hose bibb if low point is not at plumbing fixture.
- C. Install water piping on interior side of building insulation. Provide heat tape for all piping in unheated areas.
- D. Install water hammer arrestors on hot and cold water of each fixture group (e.g.: one arrestor may serve each service to a toilet). Select unit sizes and install in accord with PDI Standard WH-201.

3.5 VALVES

- A. Use ball valves for up to 4" piping. Gate valves are not approved for use up to 4" piping. Gate valves are for 6" piping and larger only.
- B. Gate valves which are part of a valve assembly are acceptable.

3.6 INSTALLATION - THERMOMETERS AND GAUGES

- A. Install pressure gauges on each side of domestic water service assembly (i.e double check, PRV, etc.).
- B. Install one pressure gauge for each pump, locate taps before strainers and on suction and discharge of pump; pipe to gauge.
- C. Install gauge taps in piping.
- D. Install pressure gauges with pulsation dampers. Provide needle valve or ball valve to isolate each gauge.
- E. Install thermometers in piping systems in sockets in short couplings. Enlarge pipes smaller than 2-1/2 inches for installation of thermometer sockets. Allow clearance from insulation.
- F. Provide instruments with scale ranges selected according to service with largest appropriate scale.
- G. Install gauges and thermometers in locations where they are easily read from normal operating level. Install vertical to 45 degrees off vertical.

- H. Adjust gauges and thermometers to final angle, clean windows and lenses, and calibrate to zero.

3.7 INSTALLATION - SERVICE CONNECTIONS

- A. Provide new water service complete with approved double check back-flow preventer, pressure reducing valve, by-pass valves, pressure gauges and strainer.
- B. Provide sleeve in wall for service main and support at wall with reinforced-concrete bridge. Caulk enlarged sleeve and make watertight with pliable material. Anchor service main inside to concrete wall.
- C. Provide 18 gauge galvanized sheet metal sleeve around service main to 6 inch above floor and 6 feet minimum below grade. Size for minimum of 2 inches of loose batt insulation stuffing.

3.8 FIELD QUALITY CONTROL

- A. Test domestic water piping system at 100 psig minimum for a period of not less than 4 hours.

3.9 CLEANING

- A. Flush system with water for minimum of 60 minutes to remove all dirt and foreign materials. Use minimum of 80 psi flushing pressure.
- B. Inject disinfectant, free chlorine in liquid, powder, tablet or gas form, throughout system to obtain residual from 50 to 80 mg/L.
- C. Bleed water from outlets to obtain distribution and test for disinfectant residual at a minimum of 15 percent of outlets.
- D. Maintain disinfectant in system for 24 hours.
- E. Flush disinfectant from system until residual concentration is equal to incoming water or 1.0 mg/L.

END OF SECTION

SECTION 22 13 00 - FACILITY SANITARY SEWERAGE

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Sanitary sewer piping, buried within 5 feet of building.
 2. Sanitary sewer piping, above grade.
 3. Condensate drains
 4. Floor drains.
 5. Trench drains.
 6. Floor sinks.
 7. Cleanouts.
 8. Interceptors.
 9. Sewage ejectors.

PART 2 PRODUCTS

2.1 SANITARY SEWER PIPING, BURIED WITHIN 5 FEET OF BUILDING

- A. Cast Iron Pipe & Fittings: ASTM A888, CISPI 301, hub-less. Made in USA by AB&I, Charlotte or Tyler marked with collective trademark of the Cast Iron Soil Pipe Institute (CISPI) and listed by NSF International.
1. Fittings: ASME B16.45 or ASSE 1043, long pattern cast iron, hubless.
 2. Joints: Heavy-Duty, Shielded, Stainless-Steel coupling with all type 304 stainless steel shield and band assembly, 80 in/lbs worm drive. ASTM C-564 Neoprene gasket. CISPI 310 and certified by NSF international. Minimum 4 clamps up to 4", 6 clamps for 5" and larger. Husky SD (Super-Duty) 4000, Clamp-All 125, Ideal Tridon Super Heavy-Duty, Mifab QXHUB Heavy Duty or approved equal.
- B. ABS Pipe: Schedule 40, ABS material, DWV, Cellular Core, bell and spigot style solvent sealed ends. NSF Standard 14, ASTM F628, ASTM D3965.
1. Fittings: ABS, DWV, ASTM D2661.
 2. Joints: Solvent weld. ASTM D2235.
- C. PVC Pipe: Schedule 40 solid wall PVC, bell and spigot solvent sealed ends. NSF Standard 14, ASTM D1785, ASTM D1784.
1. Fittings: Schedule 40, PVC, ASTM D2665.
 2. Joints: Solvent weld with ASTM D2564 solvent cement.

2.2 SANITARY SEWER PIPING, ABOVE GRADE

- A. Cast Iron Pipe & Fittings: ASTM A888, CISPI 301, hub-less. Made in USA by AB&I, Charlotte or Tyler marked with collective trademark of the Cast Iron Soil Pipe Institute (CISPI) and listed by NSF International.
1. Fittings: ASME B16.45 or ASSE 1043, long pattern cast iron, hubless.
 2. Joints: Heavy-Duty, Shielded, Stainless-Steel coupling with all type 304 stainless steel shield and band assembly, 80 in/lbs worm drive. ASTM C-564 Neoprene gasket. CISPI 310 and certified by NSF international. Minimum 4 clamps up to 4", 6 clamps for 5" and larger. Husky SD (Super-Duty) 4000, Clamp-All 125, Ideal Tridon Super Heavy-Duty, Mifab QXHUB Heavy Duty or approved equal.
 3. Joints: Standard-Duty, Shielded, Stainless-Steel coupling with all type 304 stainless steel shield and band assembly. ASTM C-564 Neoprene gasket. CISPI

310 and certified by NSF international. Husky HD 2000, Clamp-All 80, Mission Heavyweight, Ideal Tridon Heavy-Duty "HD" Yellow or approved equal.

- B. Copper Tube (Use only for short piping sections where dimensional constraints require thin wall pipe): ASTM B306 DWV.
 - 1. Fittings: Long Pattern, ASME B16.23, cast bronze, or ASME B16.29, wrought copper.
 - 2. Joints: Solder, lead free, ASTM B32, 95-5 tin-antimony, or tin and silver.
- C. **[VENT ONLY]** ABS Pipe: Schedule 40, ABS, DWV, Cellular Core, bell and spigot style solvent sealed ends (If approved by local authorities). NSF Standard 14, ASTM F628, ASTM D3965. **Not for use in air plenum.**
 - 1. Fittings: ABS, DWV, ASTM D2661.
 - 2. Joints: Solvent weld. ASTM D2235.
- D. **[VENT ONLY]** PVC Pipe: Schedule 40 solid wall PVC, bell and spigot solvent sealed ends (If approved by local authorities). NSF Standard 14, ASTM D1785, ASTM D1784. **Not for use in air plenum.**
 - 1. Fittings: Schedule 40, PVC, ASTM D2665.
 - 2. Joints: Solvent weld with ASTM D2564 solvent cement.

2.3 SANITARY SEWER PIPING, FORCE MAIN

- A. Steel Pipe: Schedule 40, galvanized. ASTM A53.
 - 1. Fittings: Steel, grooved, hot dipped galvanized.
 - 2. Joints: Mechanical Coupling, hot dipped galvanized, elastomeric sealing gasket, steel bolts and washers. Victaulic or approved equal.
- B. PVC Pipe: Schedule 40 solid wall PVC, ASTM D1785, ASTM D1784.
 - 1. Fittings: Schedule 40, PVC, ASTM D2665.
 - 2. Joints: Solvent weld with ASTM D2564 solvent cement.

2.4 NO-HUB TRANSITION COUPLING FOR JOINING CAST IRON AND PVC PIPE

- A. Coupling shall be Tested and Certified to ASTM C 1460 and be constructed with type 304 stainless steel shield, thickness 0.015, gasket material to meet ASTM C564, 1-1/2" - 4" will be 3" wide with four (4) 304 stainless steel bands and 6" - 10" will be 4" wide with six (6) 304 stainless steel bands and 3/8" 305 stainless steel hex head screws torqued to 80 inch pounds. Husky SD 4000 PVC x CI or approved equal.

2.5 EQUIPMENT DRAINS (CONDENSATE)

- A. CPVC Pipe: Schedule 40. ASTM D2846. **Not for use in air plenum.**
 - 1. Fittings: Schedule 40 CPVC. ASTM D2846.
 - 2. Joints: Solvent weld with ASTM F493 solvent cement. ASTM D2846.

2.6 FLOOR DRAINS

- A. Manufacturers: Zurn, Josam, J.R. Smith, Wade or approved equal.
- B. General Service: Cast iron body, membrane clamp, adjustable collar, polished nickel bronze strainer, trap primer connection. Provide funnel where scheduled.

2.7 TRENCH DRAIN

- A. Manufacturers: Zurn, J.R. Smith, Aco or approved equal.

- B. 6" wide, sloped modular channel sections with interlocking end and radiused bottom, HDPE, extra heavy duty frame with anchor studs and grate lockdown, ductile iron cast bar grate with H-20 rating.

2.8 FLOOR SINKS

- A. Manufacturers: Zurn, Josam, J.R. Smith, Wade or approved equal.
- B. Cast iron body with white acid resisting porcelain enamel coating on body and grate, sump dome strainer, trap primer connection.

2.9 CLEANOUTS

- A. Manufacturers: Zurn, J.R. Smith, Josam, Wade or approved equal.
- B. Exterior or interior vehicle areas: Heavy-Duty round coated cast iron body and cover with bronze plug.
- C. Exterior Surfaced Areas: Round cast nickel bronze access frame with bronze gasket threaded plug and non-skid cover.
- D. Exterior Unsurfaced Areas: Line type with lacquered cast iron body and bronze gasket threaded plug.
- E. Interior Finished Floor Areas: Type of ferrule, top and cover as required for the type of floor construction, finish surface and traffic conditions. Cleanout construction material to match waste piping with anchor flange, threaded top assembly, and round scored cover with gasket in service areas and round depressed cover with gasket to accept floor finish in finished floor areas. For carpet provide marker. For cast iron construction provide bronze gasket threaded plug.
- F. Interior Finished Wall Areas: Cleanout construction material to match waste piping, line type with round gasket threaded plug, and round stainless steel access cover secured with machine screw. For cast iron construction provide bronze gasket threaded plug.
- G. Interior Unfinished Accessible Areas: Threaded type. Provide bolted stack cleanouts on vertical waste stacks.

2.10 HAND HOLE ACCESS VAULT

- A. Manufacturers: Utility Vault or approved equal.
- B. Construction: Minimum 2' W x 3' L pre-cast concrete vault with side knockouts, galvanized diamond plate cover w/locking latch. Provide risers as required to meet grade.

2.11 FLASHING AND COUNTERFLASHING

- A. 3lb. lead soldered joints and seams, 24 x 24 base pad and counterflashed into pipe.

2.12 TRAP PRIMER

- A. Manufacturers: PPP, Wade, J.R. Smith, Josam, Watts, Zurn or approved equal.
- B. Construction: Automatic, bronze body, integral vacuum breaker.

- C. See 221100 for trap primer piping.
- 2.13 TRAP PRIMER TAIL PIECE
- A. Manufacturers: PPP or approved equal.
 - B. Construction: 1-1/2" tail piece trap primer assembly with 1/2" stainless steel flexible priming water line and chrome plated escutcheon.
 - C. See 221100 for trap primer piping.
- 2.14 AIR GAP FITTING
- A. Manufacturers: Zurn Z-1025 or equal by J.R. Smith or approved equal.
 - B. Construction: Inline, fixed air gap, coated cast iron.
- 2.15 SUMPS
- A. Manufacturers: B&G, Weil, or approved equal.
 - B. Sump: Precast concrete or glass fiber reinforced with required openings and drainage fittings.
 - C. Cover: 3/8 inch thick checkered steel plate with gasket seal frames and anchor bolts.
- 2.16 GREASE INTERCEPTORS
- A. Manufacturers: Schier or approved equal
 - B. Construction: Made in USA
 1. Material: Seamless, rotationally-molded, High Density Polyethylene with minimum 3/8" uniform wall thickness.
 2. Rough in: Below grade, provide risers for cover to meet grade.
 3. Certified by NSF and listed by IAPMO to ASME A112.14.3 - Grease Interceptors standards, PDI rated at 100 ppm.
 - C. Cover: Water and gas-tight cover with minimum H2O load capacity.
 - D. Accessories:
 1. Adjustable riser system for extension to grade
 2. Anchor kit (on required for high water table)
- 2.17 SEWAGE EJECTION PUMP
- A. Manufacturers: Weil or approved equal. Explosion proof pumps and controls..
 - B. Type: Vertical centrifugal, direct connected, duplex arrangement.
 - C. Casing: Cast iron volute with radial clearance around impeller, slide away couplings.
 - D. Impeller: Bronze, open non-clog, keyed to stainless steel shaft.
 - E. Support: Cast iron pedestal motor support on steel floor plate with gas tight gaskets.

- F. Bearings: Forced grease lubricated bronze sleeve spaced maximum 48 inches and grease lubricated ball thrust at floor plate.
- G. Drive: Flexible coupling to vertical, solid shaft ball bearing electric motor.
- H. Sump: Steel cover plate with inspection opening and cover, and alarm fittings.
- I. Controls (Duplex): Float operated mechanical alternator with float rod, stops, and corrosion resistant float to alternate operation of pumps. Cut-in second pump on rising level or lead pump failure. Furnish separate pressure switch high level alarm with transformer, alarm bell, and standpipe, and extra set of wired terminals for remote alarm circuit and emergency float switch with float rod, stops, and corrosion resistant float to operate both pumps on failure of alternator.

PART 3 EXECUTION

3.1 PREPARATION

- A. Remove scale and dirt, on inside and outside, before assembly.
- B. Prepare piping connections to equipment with flanges or unions.
- C. Verify and provide required extensions, clamps and drain styles to match floor construction and finish.

3.2 INSTALLATION

- A. Coordinate location of floor drains in mechanical spaces with mechanical contractor equipment layout.
- B. Protect floor drain strainer during construction.
- C. Traps:
 - 1. Install trap seal maintenance devices only where called for on plans or approved by engineer; at all other drain locations provide automatic trap primers.
 - 2. Install automatic trap primers throughout at site drains and floor drains except those located in showers or provided with trap seal maintenance devices.
 - 3. Provide access panels for automatic trap primers.
 - 4. Adjust automatic trap primer pressure setting for proper operation.
- D. Align square floor drains with floor tiles or parallel with walls.
- E. Install interceptors with top flush with adjacent surface or grade. Provide quantity and size of vents as indicated in manufacturer's literature. Terminate vents minimum 10 feet above grade or through roof at a location determined by the architect.

3.3 CONDENSATE PIPING

- A. Provide condensate piping for air-conditioning and high-efficiency gas fired equipment. Coordinate quantity required with mechanical contractor. Provide minimum 3" deep p-trap at equipment.
- B. Determine best routing to nearest indirect waste using minimum 3/4" piping with minimum 1/8" per foot slope. Acceptable indirect waste locations are service sink, laundry sink, floor drain or air gap fitting into waste pipe. Provide open drain box or access panel for

air gap fitting as approved by local authority. Discharge onto roof or at grade is acceptable if allowed by local code, provide splash block.

- C. If proper slope cannot be achieved advise Mechanical Contractor to provide condensate pump.

3.4 INSTALLATION - BURIED PIPING SYSTEMS

- A. Verify connection to existing piping system size, location, and invert are as indicated on Drawings.
- B. Provide connections to site mains as indicated on drawings.
- C. Grade piping at 1/4" per foot where possible, but in no case less than 1/8" per foot. Install all main vertical soil and waste stacks with provisions for expansion and extend full size to roof line as vents.
- D. Install buried ABS piping per ASTM D2321 and ASTM F1668.
- E. Backfill trenching with pea-gravel if available at site for other purposes. If pea-gravel is unavailable, native soil may be used for backfill if all the following conditions are met.
 1. All broken concrete and sharp stones (+1" dia.) to be removed from backfill soil.
 2. All large stones (3' dia. or bigger) to be removed from backfill soil.
 3. Piping shall be bedded on min. 2" thickness of replaced "rock free" soil and then checked for grade.
- F. Establish elevations of buried piping with not less than 3 ft of cover.
- G. Establish minimum separation from other services piping in accordance with Code.
- H. Provide piping layout to satisfy the UPC requirements for suds relief.
- I. Route pipe in straight line.
- J. Install pipe to allow for expansion and contraction without stressing pipe or joints.
- K. Install plastic ribbon tape continuous over top of pipe.
- L. Install trace wire continuous over top of pipe.

3.5 INSTALLATION - ABOVE GROUND PIPING

- A. Route piping in orderly manner and maintain gradient at 1/4" per foot where possible, but in no case less than 1/8" per foot. Route parallel and perpendicular to walls.
- B. Install piping to maintain headroom without interfering with use of space or taking more space than necessary.
- C. Group piping whenever practical at common elevations.
- D. Install piping on interior side of building insulation.
- E. Provide heat tape for all p-traps in unheated areas.
- F. Sleeve pipe passing through partitions, walls and floors.

- G. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- H. Protection: Where piping, other than cast iron or steel, is installed in a concealed location through holes or notches in framing (i.e. studs, joists, rafters, etc.), less than 1-1/2 from framing edge, provide shield plates. Shield plates shall be 16 gauge steel and cover the piping area within framing plus 2" on each side along framing.
- I. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.
- J. Provide access panel where valves and fittings are not accessible.
- K. Install non-conducting dielectric connections wherever jointing dissimilar metals.
- L. Establish invert elevations, slopes for drainage to 1/4 inch per foot minimum. Provide 1/8 inch per foot only where necessary and allowed by local jurisdiction. Maintain gradients.
- M. Provide piping layout to satisfy the UPC requirements for suds relief.
- N. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.
- O. Install piping penetrating roofed areas to maintain integrity of roof assembly.
- P. Insulate piping. Refer to Section 22 07 00.
- Q. Install pipe identification in accordance with Section 22 05 00.

3.6 INSTALLATION - SANITARY WASTE AND VENT SYSTEMS

- A. Install sanitary waste and vent piping systems in accordance with ASME B31.9 and local plumbing code.
- B. Support cast iron drainage piping at every joint.
- C. Flash and counterflash. Install vents passing through roof with roof flashing and counterflashing assemblies. 3lb. lead soldered joints and seams, 24 x 24 base pad and counterflashed into pipe.
- D. Install automatic trap primers throughout at floor drains except those located in showers. Provide access panel for trap primers.
- E. Provide piping layout to satisfy the UPC requirements for suds relief.
- F. Provide cleanouts every 50 feet and install at all locations required by code and to permit cleaning of all waste piping. Provide cleanouts full size of pipe, but no larger than 4". Coordinate with Architect when cleanouts are located in finished rooms. Install cleanout threads with graphite. Locate cleanouts to clear cabinet work and to be easily accessible.

3.7 INSTALLATION - PUMPS

- A. Provide pumps operating at specified system fluid temperatures without vapor binding and cavitation, non-overloading in parallel or individual operation, and operating within 25 percent of midpoint of published maximum efficiency curve.

- B. Provide shaft length allowing ejector pumps to be located minimum 24 inches below lowest invert into sump pit and minimum 6 inches clearance from bottom of sump pit.
- C. Provide air cock and drain connection on horizontal pump casings.
- D. Provide line sized ball valve and line sized soft seated check valve on pump discharge.
- E. Decrease from line size with long radius reducing elbows or reducers. Support piping adjacent to pump independently of pump casings. Install supports under elbows on pump discharge line sizes 4 inches and larger.
- F. Check, align, and certify alignment of pumps prior to start-up.

3.8 FIELD QUALITY CONTROL

- A. Obtain written approval of local Plumbing Authority prior to covering or concealing any work.
- B. Test sanitary waste and vent piping system to hydrostatic test of 10 feet head of water.

END OF SECTION

SECTION 22 14 00 - FACILITY STORM DRAINAGE

PART 1 **GENERAL**

1.1 SUMMARY

- A. Section Includes:
1. Storm water piping, buried within 5 feet of building.
 2. Storm water piping, above grade.
 3. Roof drains.
 4. Parapet drains.
 5. Downspout nozzles.
 6. Cleanouts.

PART 2 **PRODUCTS**

2.1 STORM WATER PIPING, BURIED WITHIN 5 FEET OF BUILDING

- A. Cast Iron Pipe & Fittings: ASTM A888, CISPI 301, hub-less. Made in USA by AB&I, Charlotte or Tyler marked with collective trademark of the Cast Iron Soil Pipe Institute (CISPI) and listed by NSF International.
1. ASME B16.45 or ASSE 1043, long pattern cast iron, hubless.
 2. Joints: Heavy-Duty, Shielded, Stainless-Steel coupling with all type 304 stainless steel shield and band assembly, 80 in/lbs worm drive. ASTM C-564 Neoprene gasket. CISPI 310 and certified by NSF international. Minimum 4 clamps up to 4", 6 clamps for 5" and larger. Husky SD (Super-Duty) 4000, Clamp-All 125, Ideal Tridon Super Heavy-Duty, Mifab QXHUB Heavy Duty or approved equal.
- B. ABS Pipe: Schedule 40, ABS material, DWV, Cellular Core, bell and spigot style solvent sealed ends. NSF Standard 14, ASTM F628, ASTM D3965.
1. Fittings: ABS, DWV, ASTM D2661.
 2. Joints: Solvent weld. ASTM D2235.
- C. PVC Pipe: Schedule 40 solid wall PVC, bell and spigot solvent sealed ends. NSF Standard 14, ASTM D1785, ASTM D1784.
1. Fittings: Schedule 40, PVC, ASTM D2665.
 2. Joints: Solvent weld with ASTM D2564 solvent cement.

2.2 STORM WATER PIPING, ABOVE GRADE

- A. Cast Iron Pipe: ASTM A888, CISPI 301, hub-less. Made in USA by AB&I, Charlotte or Tyler marked with collective trademark of the Cast Iron Soil Pipe Institute (CISPI) and listed by NSF International.
1. Fittings: ASME B16.45 or ASSE 1043, long pattern cast iron, hubless.
 2. Joints: Heavy-Duty, Shielded, Stainless-Steel coupling with all type 304 stainless steel shield and band assembly, 80 in/lbs worm drive. ASTM C-564 Neoprene gasket. CISPI 310 and certified by NSF international. Minimum 4 clamps up to 4", 6 clamps for 5" and larger. Husky SD (Super-Duty) 4000, Clamp-All 125, Ideal Tridon Super Heavy-Duty, Mifab QXHUB Heavy Duty or approved equal.
 3. Joints: Standard-Duty, Shielded, Stainless-Steel coupling with all type 304 stainless steel shield and band assembly. ASTM C-564 Neoprene gasket. CISPI 310 and certified by NSF international. Husky HD 2000, Clamp-All 80, Mission Heavyweight, Ideal Tridon Heavy-Duty "HD" Yellow or approved equal.

- B. ABS Pipe: Schedule 40, ABS, DWV, Cellular Core, bell and spigot style solvent sealed ends (If approved by local authorities). NSF Standard 14, ASTM F628, ASTM D3965. **Not for use in air plenum.**
 - 1. Fittings: ABS, DWV, ASTM D2661.
 - 2. Joints: Solvent weld. ASTM D2235.
- C. PVC Pipe: Schedule 40 solid wall PVC, bell and spigot solvent sealed ends (If approved by local authorities). NSF Standard 14, ASTM D1785, ASTM D1784.
 - 1. Fittings: Schedule 40, PVC, ASTM D2665. **Not for use in air plenum.**
 - 2. Joints: Solvent weld with ASTM D2564 solvent cement.

2.3 NO-HUB TRANSITION COUPLING FOR JOINING CAST IRON AND PVC PIPE

- A. Coupling shall be Tested and Certified to ASTM C 1460 and be constructed with type 304 stainless steel shield, thickness 0.015, gasket material to meet ASTM C564, 1-1/2" - 4" will be 3" wide with four (4) 304 stainless steel bands and 6" - 10" will be 4" wide with six (6) 304 stainless steel bands and 3/8" 305 stainless steel hex head screws torqued to 80 inch pounds. Husky SD 4000 PVC x CI or approved equal.

2.4 ROOF DRAINS

- A. Manufacturers: Zurn, Josam, J.R. Smith, Wade or approved equal.
- B. Coated cast iron body with aluminum dome, membrane flange and clamp, underdeck clamp, roof sump receiver, waterproofing flange, adjustable extension sleeve for roof insulation. On overflow drains provide 2" internal water dam.

2.5 DOWNSPOUT NOZZLE

- A. Manufacturers: Zurn Z-199 or approved equal.
- B. Construction: Nickel bronze body, decorative face wall flange, outlet "cow's tongue" nozzle, stainless steel screen.

2.6 CLEANOUTS

- A. Manufacturers: Zurn, J.R. Smith, Josam, Wade or approved equal.
- B. Exterior Surfaced Areas: Round cast nickel bronze access frame with bronze gasket threaded plug and non-skid cover.
- C. Exterior Unsurfaced Areas: Line type with lacquered cast iron body and bronze gasket threaded plug.
- D. Interior Finished Floor Areas: Type of ferrule, top and cover as required for the type of floor construction, finish surface and traffic conditions. Cleanout construction material to match waste piping with anchor flange, threaded top assembly, and round scored cover with gasket in service areas and round depressed cover with gasket to accept floor finish in finished floor areas. For carpet provide marker. For cast iron construction provide bronze gasket threaded plug.
- E. Interior Finished Wall Areas: Cleanout construction material to match waste piping, line type with round gasket threaded plug, and round stainless steel access cover secured with machine screw. For cast iron construction provide bronze gasket threaded plug.

- F. Interior Unfinished Accessible Areas: Threaded type. Provide bolted stack cleanouts on vertical rainwater leaders.

PART 3 **EXECUTION**

3.1 PREPARATION

- A. Verify and provide required extensions, clamps and drain styles to match deck or roof construction and finish.

3.2 INSTALLATION - BURIED PIPING SYSTEMS

- A. Verify connection to existing piping system size, location, and invert are as indicated on Drawings.
- B. Provide connections to site mains as indicated on drawings.
- C. Grade piping at 1/4" per foot where possible, but in no case less than 1/8" per foot. Install all main vertical soil and waste stacks with provisions for expansion and extend full size to roof line as vents.
- D. Backfill trenching with pea-gravel if available at site for other purposes. If pea-gravel is unavailable, native soil may be used for backfill if all the following conditions are met.
 - 1. All broken concrete and sharp stones (+1" dia.) to be removed from backfill soil.
 - 2. All large stones (3' dia. or bigger) to be removed from backfill soil.
 - 3. Piping shall be bedded on min. 2" thickness of replaced "rock free" soil and then checked for grade.
- E. Establish elevations of buried piping with not less than 3 ft of cover.
- F. Establish minimum separation from other services piping in accordance with Code.
- G. Route pipe in straight line.
- H. Install pipe to allow for expansion and contraction without stressing pipe or joints.
- I. Install shutoff and drain valves at locations indicated on Drawings.
- J. Install plastic ribbon tape continuous over top of pipe.
- K. Install trace wire continuous over top of pipe.

3.3 INSTALLATION - ABOVE GROUND PIPING

- A. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- B. Install piping to maintain headroom without interfering with use of space or taking more space than necessary.
- C. Group piping whenever practical at common elevations.
- D. Install piping on interior side of building insulation.
- E. Sleeve pipe passing through partitions, walls and floors.

- F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- G. Protection: Where piping, other than cast iron or steel, is installed in a concealed location through holes or notches in framing (i.e. studs, joists, rafters, etc.), less than 1-1/2 from framing edge, provide shield plates. Shield plates shall be 16 gauge steel and cover the piping area within framing plus 2" on each side along framing.
- H. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.
- I. Establish invert elevations, slopes for drainage to 1/4 inch per foot minimum. Provide 1/8 inch per foot only where necessary and allowed by local jurisdiction. Maintain gradients.
- J. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.
- K. Install piping penetrating roofed areas to maintain integrity of roof assembly.
- L. Insulate piping. Refer to Section 22 07 00.
- M. Install pipe identification in accordance with Section 22 05 00.

3.4 INSTALLATION - STORM DRAINAGE PIPING SYSTEMS

- A. Install storm drainage piping systems in accordance with ASME B31.9 and local plumbing code.
- B. Support cast iron drainage piping at every joint.
- C. Roof drain flashing and counter flashing. 3lb. lead soldered joints and seams, 24 x 24 base pad.
- D. Provide cleanouts every 50 feet and install at all locations required by code and to permit cleaning of all waste piping. Provide cleanouts full size of pipe, but no larger than 4". Coordinate with Architect when cleanouts are located in finished rooms. Install cleanout threads with graphite. Locate cleanouts to clear cabinet work and to be easily accessible.

3.5 FIELD QUALITY CONTROL

- A. Obtain written approval of local Plumbing Authority prior to covering or concealing any work.
- B. Test storm piping system to hydrostatic test of 10 feet head of water.

END OF SECTION

SECTION 22 23 00 - NATURAL GAS SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Natural gas piping buried within 5 feet of building.
 - 2. Natural gas piping above grade.
 - 3. Coordination with local gas company
 - 4. Valves & Strainers.
 - 5. Natural gas pressure regulators.

1.2 SYSTEM DESCRIPTION

- A. Where more than one piping system material is specified, provide compatible system components and joints. Use non-conducting dielectric connections when joining dissimilar metals in systems.
- B. Provide flanges, unions, or couplings at locations requiring servicing. Use unions, flanges, or couplings downstream of valves and at equipment connections. Do not use direct welded or threaded connections to valves, equipment.
- C. Use ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.

1.3 QUALITY ASSURANCE

- A. Comply with requirements and recommendations of NFPA 54 and the International Fuel Gas Code.
- B. Perform work in accordance with applicable code and local gas company requirements.
- C. Furnish shutoff valves complying with ASME B16.33 or ANSI Z21.15.

1.4 COORDINATION

- A. Refer to plans for meter location and coordinate with the Gas Company for installation and size. Facilitate application for gas service and pay all charges necessary for complete installation.

PART 2 PRODUCTS

2.1 NATURAL GAS PIPING, BURIED WITHIN 5 FEET OF BUILDING

- A. Steel Pipe: ASTM A53, Schedule 40 black, seamless. Manufactured in the USA.
 - 1. Fittings: ASTM A234, forged steel welding type.
 - 2. Joints: ASME B31.9, welded.
 - 3. Jacket: AWWA C105 polyethylene jacket or double layer, half-lapped 10 mil polyethylene tape.

2.2 NATURAL GAS PIPING, ABOVE GRADE

- A. Steel Pipe: ASTM A53, Schedule 40 black, seamless. Manufactured in the USA.
 - 1. Fittings: ASME B16.3, malleable iron, or ASTM A234, forged steel welding type.

2. Joints: 2 inch and smaller pipe - Threaded.
3. Joints: 2-1/2 inches and larger pipe – welded.

- B. Steel Pipe: ASTM A53, Schedule 40 black, seamless. Manufactured in the USA.
1. Fittings: Compression type, Viega MegaPress G or NIBCO BenchPressG. ANSI LC4-2012, zinc and nickel coating, HNBR sealing element, 420 stainless steel grip ring, 304 stainless steel separator ring and smart connect feature.
 2. Joints: 4 inch and smaller pipe - Viega MegaPress G or NIBCO BenchPressG tool press.

2.3 BALL VALVES

- A. Manufacturers: Nibco, Stockham, Milwaukee, or approved equal.
- B. 1/2 inch to 3/4 inch (appliance shutoff valve): 1/2 psi rated for indoor appliance connections per ANSI Z21.15. Forged brass body, chrome plated brass ball, fluorocarbon o-rings, brass stem, painted aluminum lever handle. (Nibco G10)
- C. 1/4 inch to 1 inch: MSS SP 110, Class 125, two piece, threaded ends, bronze body, chrome plated bronze ball, reinforced teflon seats, blow-out proof stem, lever handle, UL 842 listed for flammable liquids and LPG, full port. (Nibco T585-70-UL)
- D. 1-1/4 inch to 3 inch: MSS SP 110, Class 125, two piece, threaded ends, bronze body, chrome plated bronze ball, reinforced teflon seats, blow-out proof stem, lever handle, UL 842 listed for flammable liquids and LPG, conventional port. (Nibco T580-70-UL)

2.4 FLEXIBLE PIPE CONNECTIONS

- A. Tubing: Annealed, 304 stainless steel, ASTM A240
- B. Fittings: Brass or stainless steel.
- C. Coating: Yellow polymer.

2.5 QUICK CONNECT FITTING

- A. Manufacturers: T&S or approved equal.
- B. 3/4" one-way shut-off coupling and plug body. Bass body construction with stainless steel internal parts.

2.6 EARTHQUAKE VALVE

- A. Manufacturers: California Seismic Valves 300 series or approved equal.
- B. Valve shall be full size of pipe off meter. No external electrical power required. Swing check valve arrangement with an acceleration sensitive triggering mechanism. Trip mechanism consists of steel ball. Horizontal motion of an earthquake triggers shut off. Manual reset. Sight glass indicates open or closed.

2.7 EXTERIOR WALL OUTLET

- A. Manufacturer: Burnaby #GR0101-SS or approved equal.
- B. Recessed stainless steel gas outlet box with brushed finish, 1/2" NPT pipe connection, shutoff valve, 3/8" quick disconnect plug, lockable access door.

2.8 STRAINERS

- A. 2 inch and Smaller: Screwed brass or iron body for 175 psig working pressure, Y pattern with 1/32 inch stainless steel perforated screen.
- B. 2-1/2 inch to 4 inch: Flanged iron body for 175 psig working pressure, Y pattern with 3/64 inch stainless steel perforated screen.

2.9 NATURAL GAS PRESSURE REDUCING VALVES

- A. Manufacturers: Fisher or approved equal.
- B. Product Description: Quick-reacting, low-shock natural gas, spring loaded pressure regulator, ductile Iron body, aluminum casings and orifice, nitrile diaphragm and o-rings, full internal relief, 125 psi inlet rated. Threaded or flanged ends depending on size.

2.10 NATURAL GAS PRESSURE REDUCING VALVES (VENTLESS)

- A. Manufacturers: Maxitrol 325-L Series or approved equal.
- B. Product Description: High leverage linkage assembly with positive dead-end lockup pressure regulator. Aluminum housing, threaded ends. Provide with VLimiter vent limiting device.

PART 3 EXECUTION

3.1 GAS METERS AND DISTRIBUTION

- A. Refer to plans for meter location and coordinate with the Gas Company for installation and size. Facilitate application for gas service and pay all charges necessary for complete installation.

3.2 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt, on inside and outside of pipe, before assembly.
- C. Prepare piping connections to equipment with flanges or unions.

3.3 INSTALLATION - BURIED PIPING SYSTEMS

- A. Install natural gas piping in accordance with NFPA 54 and the International Fuel Gas Code.
- B. Verify connection to existing piping system size, location, and invert.
- C. Establish elevations of buried piping with not less than 2 ft of cover.
- D. Establish minimum separation from other services piping in accordance with code.
- E. Install pipe on prepared bedding.
- F. Route pipe in straight line.

- G. Install pipe to allow for expansion and contraction without stressing pipe or joints.
- H. Install plastic ribbon tape continuous over top of pipe and buried 6 inches below finish grade, above pipe line.

3.4 INSTALLATION - ABOVE GROUND PIPING SYSTEMS

- A. Install natural gas piping in accordance with NFPA 54 and the International Fuel Gas Code.
- B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- C. Grade horizontal pipe not less than ¼" in 15 feet.
- D. Route piping in orderly manner and to conserve building space and not interfere with use of space.
- E. Group piping whenever practical at common elevations.
- F. Provide 6" long drip leg at bottom of vertical pipe.
- G. Take from top or side of horizontal pipe.
- H. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- I. Sleeve pipe passing through partitions, walls and floors.
- J. Install firestopping at fire rated construction perimeters and openings containing penetrating sleeves and piping.
- K. Provide clearance for access to valves and fittings.
- L. Provide access doors where valves and fittings are not exposed.
- M. Do not embed any building service low pressure pipe in concrete, in masonry, or below grade. Install such pipe in Schedule 40 welded pipe sleeves and vent to roof.
- N. Provide support for utility meters in accordance with requirements of utility company.
- O. Prepare pipe, fittings, supports, and accessories not pre-finished, ready for finish painting.
- P. Install identification on piping systems.
- Q. Install valves with stems upright or horizontal, not inverted.
- R. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.

3.5 INSTALLATION – EQUIPMENT CONNECTION

- A. Provide shutoff valve and flexible pipe at connections to all equipment. Use sufficient flexible pipe length to allow for 4" of movement.

- B. Connect piping to unit, full size of unit gas train inlet. Arrange piping with clearance for burner and equipment service.
- C. Provide drip leg.
- D. Provide strainer.

3.6 INSTALLATION – APPLIANCES

- A. Range: Align gas piping with recess behind appliance. Coordination size and location of recess with range manufacturer's installation instructions. Gas piping installation shall not prevent range from being fully installed against wall.

3.7 PRESSURE REDUCING VALVES

- A. Install per manufacturer's recommendations. If PRV is installed indoors determine routing to an approved location and provide independent relief pipe to outside. Size relief vent pipe full port size, $\frac{3}{4}$ " minimum. Increase vent pipe size one pipe size for lengths greater than 15'. Increase vent pipe size two pipe sizes for lengths greater than 25'.

3.8 FIELD QUALITY CONTROL

- A. Pressure test natural gas piping in accordance with NFPA 54 and the International Fuel Gas Code.
- B. Subject pipe to air pressure of 60 psig for 30 minutes with no perceptible drop in pressure.
- C. When pressure tests do not meet specified requirements, remove defective work, replace and retest.

END OF SECTION

SECTION 22 30 00 - PLUMBING EQUIPMENT

PART 1 **GENERAL**

1.1 SUMMARY

- A. Section Includes:
 - 1. Water heaters.
 - 2. Diaphragm-type expansion tanks.
 - 3. In-line circulator pumps.
 - 4. Water heater venting (Plastic)

1.2 VENTING

- A. Provide plastic venting and combustion air for water heaters and boilers in this section.

1.3 COORDINATION

- A. For equipment which requires metal venting coordinate required material and location with Division 23.

1.4 QUALITY ASSURANCE

- A. Water Heater Performance Requirements: Equipment efficiency not less than prescribed by Washington State Energy Code and scheduled on drawings.

PART 2 **PRODUCTS**

2.1 COMMERCIAL GAS FIRED WATER HEATERS

- A. Manufacturers: Laars "U.H.E.", HTP or approved equal.
- B. Type: Automatic, natural gas-fired, condensing, sealed combustion, vertical storage.
- C. Tank: Steel with glass lining; minimum 2" polyurethane thermal insulation (R-14), encased in corrosion-resistant jacket; zero clearance to combustibles. 95%-99% thermal efficiency.
- D. Controls: Electronic water thermostat with adjustable temperature range from 120 to 180 degrees F with LCD display; Automatic reset high temperature limiting thermostat, low water cutoff, upper hot water sensor, lower cold water sensor, gas pressure regulator, electronic direct spark ignition system.
- E. Factory-Installed Appurtenances:
 - 1. Four replaceable magnesium anode rods.
 - 2. Brass drain valve.
 - 3. T&P relief valve.
 - 4. Zero clearance to combustibles.
 - 5. Bolted hand hole cleanout.
 - 6. Sediment reducing cold water inlet tube.
 - 7. Dielectric fittings.
- F. Accessories:
 - 1. Direct venting concentric termination kit.

2.2 DIAPHRAGM-TYPE EXPANSION TANKS

- A. Manufacturers: Amtrol, Armstrong or approved equal.
- B. Construction: Welded steel, tested and stamped in accordance with ASME Section VIII; with pre-charged flexible EPDM diaphragm sealed into tank; steel ring base (vertical) or saddles (horizontal)
- C. Accessories: Pressure gage and air-charging fitting, tank drain.
- D. Installation: Before installation, charge tank with Nitrogen gas to equal domestic water line pressure at tank. Permanently mark fill pressure on tank.

2.3 IN-LINE CIRCULATOR PUMPS

- A. Manufacturers: Armstrong ARMflo E Series or similar by B&G, Taco or approved equal.
- B. Type: Horizontal shaft, single stage, direct connected, with dry motor for in-line mounting, for 150 psig maximum working pressure.
- C. Casing: Cast iron, (all bronze for domestic water), with flanged pump connections.
- D. Impeller: 30% glass-filled noryl.
- E. Bearings: Sealed, permanently lubricated stainless steel.
- F. Shaft: Stainless steel.
- G. Seal: Silicon carbide enviroseal with viton elastomer. 230 degrees F maximum continuous operating temperature.
- H. Drive: Two pole, single phase.
- I. Accessories:
 - 1. 24 hour timer control.
 - 2. Temperature sensor.
 - 3. P/T test plugs

2.4 FLUE AND COMBUSTION AIR PIPING

- A. PVC Pipe: ASTM D1785, Schedule 40 solid wall, polyvinyl chloride (PVC) material.
 - 1. Fittings: ASTM D2665, Schedule 40, PVC.
 - 2. Joints: Solvent weld with ASTM D2564 solvent cement. Prime joints with a contrasting color.
- B. CPVC Pipe: ASTM F441/F441M, Schedule 40 solid wall, chlorinated polyvinyl chloride (CPVC) material.
 - 1. Fittings: ASTM F438, CPVC, Schedule 40, socket type.
 - 2. Joints: ASTM D2846/D2846M, solvent weld with ASTM F493 solvent cement. Prime joints with a contrasting color.

PART 3 EXECUTION

3.1 INSTALLATION – WATER HEATER

- A. Maintain manufacturer's recommended clearances around and over water heaters.
- B. Install water heater on concrete housekeeping pad, minimum 4 inches high and 6 inches larger than water heater base on each side. For electric water heaters include incompressible insulated surface (R-10 min).
- C. Anchor or strap to structure to resist horizontal displacement due to earthquake. IAPMO listed, galvanized steel, double body straps, Hubbard Quick Strap or approved equal.
- D. Connect domestic hot water and domestic cold water piping to water heater connections. Provide integral heat traps at connections.
- E. Install the following piping accessories. Refer to Section 22 11 00.
 - 1. On cold water:
 - a. Thermometer well and thermometer.
 - b. Strainer.
 - c. Pressure gage.
 - d. Shutoff ball valve.
 - 2. On hot water:
 - a. Thermometer well and thermometer.
 - b. Shutoff ball valve.
- F. Install discharge piping from relief valves and drain valves to nearest floor drain or indirect waste location. Determine best routing.
- G. Provide pan where required or specified.
- H. Install water heater trim and accessories furnished loose for field mounting.
- I. Install electrical devices furnished loose for field mounting.
- J. Install control wiring between water heater control panel and field mounted control devices.

3.2 INSTALLATION – NATURAL GAS FUEL FIRED

- A. Connect natural gas piping to water heater in accordance with NFPA 54, full size of water heater gas train inlet. Arrange piping with clearances for burner removal and service.
- B. Install the following piping accessories on natural gas piping connections. Refer to Section 22 23 00.
 - 1. Strainer.
 - 2. Shutoff valve.
- C. Connect flue to water heater outlet, full size of outlet.

3.3 INSTALLATION - FLUE AND COMBUSTION AIR PIPING

- A. Install flue and vent piping per manufacturer's installation instructions. Note maximum allowable venting length.

- B. Install piping to maintain headroom without interfering with use of space or taking more space than necessary.
- C. Group piping whenever practical at common elevations.
- D. Sleeve pipe passing through partitions, walls and floors.
- E. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- F. Protection: Where piping, other than cast iron or steel, is installed in a concealed location through holes or notches in framing (i.e. studs, joists, rafters, etc.), less than 1-1/2 from framing edge, provide shield plates. Shield plates shall be 16-gauge steel and cover the piping area within framing plus 2" on each side along framing.
- G. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.
- H. Provide factory vent and combustion air terminations. Flash and seal piping penetrating building exterior to maintain integrity of assembly.
- I. Install pipe identification in accordance with Section 22 05 00.

3.4 INSTALLATION – TANK & HEAT EXCHANGER

- A. Connect hot water piping to supply and return water heater connections. Provide integral heat traps at connections.
- B. Domestic Water Heat Exchangers:
 - 1. Install domestic water heat exchangers with clearance for tube bundle removal without disturbing other installed equipment or piping.
 - 2. Pipe relief valves and drains to nearest floor drain.
- C. Domestic Hot Water Storage Tanks:
 - 1. Provide support, independent of building structural framing members.
 - 2. Clean and flush after installation. Seal until pipe connections are made.
 - 3. Field insulate tank with 4", 2.5 pcf insulation with FSK facing. Install tank thermometer and pressure gauge.

3.5 INSTALLATION - PUMPS

- A. Provide pumps to operate at specified system fluid temperatures without vapor binding and cavitation, are non-overloading in parallel or individual operation, and operate within 25 percent of midpoint of published maximum efficiency curve.
- B. Install long radius reducing elbows or reducers between pump and piping. Support piping adjacent to pump so no weight is carried on pump casings. For close coupled or base mounted pumps, install supports under elbows on pump suction and discharge line sizes 4 inches and over.
- C. Provide line sized shut-off valve and strainer on pump suction, and line sized check valve, balancing valve, and shut-off valve on pump discharge.
- D. Decrease from line size with long radius reducing elbows or reducers. Support piping adjacent to pump, so no weight is carried on pump casings. Provide supports under elbows on pump suction and discharge line sizes 4 inches and larger.

- E. Provide P/T test plugs.
- F. Provide air cock and drain connection on horizontal pump casings.
- G. Provide drains for bases and seals.
- H. Where appropriate, lubricate pumps before start-up.

END OF SECTION

SECTION 22 40 00 - PLUMBING FIXTURES

PART 1 **GENERAL**

1.1 SUMMARY

- A. Section Includes:
1. General Plumbing Fixtures: Water closets, Lavatories, Sinks, Service sinks, Showers, Drinking fountains, Electric water coolers.
 2. Faucets and valves
 3. Hose bibbs & Hydrants.
 4. Accessories.

1.2 SCOPE

- A. This section includes all plumbing fixtures, trim and installation, to include owner furnished equipment.

1.3 REQUIREMENTS

- A. All china fixtures shall be white or manufacturer's standard unless otherwise indicated.
- B. Ensure that that all china fixtures install in a room or area are the exact same color and hue, especially if from different manufacturers.
- C. Fixtures by type and material shall be of the same manufacturer except when scheduled or approved otherwise.
- D. Fixtures shall be designed or equipped to meet the following water use efficiency standards:
- | | |
|-------------------------------------|----------------------|
| 1. Water closets (flush valve) | 1.28 GPF |
| 2. Shower heads | 1.8 GPM (WaterSense) |
| 3. Lavatory faucets (Public) | 0.5 GPM |
| 4. Kitchen Sink faucets | 1.8 GPM |
| 5. Sink faucets | 2.2 GPM |
| 6. Metered faucets | 0.25 GPC |
| 7. Pre-Rise Spray Valve | 1.6 GPM |

PART 2 **PRODUCTS**

2.1 FLUSH VALVE WATER CLOSETS

- A. Manufacturers: Kohler, Toto, Eljer, American Standard or approved equal.
- B. Floor Mount: white, vitreous china, 10" or 12" rough-in, 15" rim height, 1-1/2" top spud, elongated bowl, siphon jet, 2-1/4" passageway, china bolt caps.
- C. Floor Mount (ADA): white, vitreous china, 10" or 12" rough-in, 17-1/2" rim height, ADA compliant, 1-1/2" top spud, elongated bowl, siphon jet, 2-1/4" passageway, china bolt caps.

2.2 FLUSH VALVES

- A. Manufacturers: Sloan, Zurn, no equal.

- B. Water Closet (Manual): Quiet, exposed, diaphragm type, chrome plated flush valve with synthetic rubber diaphragm, dual filtered fixed bypass, ADA compliant non-hold open triple seal handle, angle stop, adjustable tailpiece, back pressure vacuum breaker, escutcheon.

2.3 WATER CLOSET SEATS

- A. Manufacturers: Bemis, Olsonite or approved equal.
- B. Open Front: Heavy duty solid plastic, white, large molded-in bumpers, external check hinges with stainless steel posts, without cover.

2.4 LAVATORIES

- A. Manufacturers: Kohler, Eljer, American Standard or approved equal.
- B. Wall Hung: white, vitreous china, wall mounted, drilled for concealed arm carrier, overflow, ADA compliant. Provide with wall carrier.
- C. Counter Top: white, vitreous china, self-rimming, overflow, ADA compliant.
- D. Undercounter: white, vitreous china, unglazed rim for under counter mount with overflow.

2.5 SINKS

- A. Manufacturers: Elkay, Just, Acorn or approved equal.
- B. Single Compartment: Seamless 18 gauge. Type 304 stainless steel, self-rimming, radius corners, sound deadening undercoat.
- C. Double Compartment: Seamless 18 gauge. Type 304 stainless steel, self-rimming, radius corners, sound deadening undercoat.
- D. Bar: Seamless 18 gauge. Type 304 stainless steel, self-rimming, radius corners, sound deadening undercoat.
- E. Scullery: 14 gauge stainless steel, welded construction ground smooth, 1/4" radius corners, wall and floor mounted with tubular stainless steel legs, 8" high full length backsplash with 45 deg. slope top, 1-1/2" wide inward slopping top channel rims, integral drainboards sloped to drain, drilled for faucet and drain outlets, satin finish.

2.6 SERVICE SINKS

- A. Manufacturers: Fiat, Florestone, Kohler or approved equal.
- B. Floor: Molded stone, 10" deep, stainless steel drain body with strainer and lint basket, vinyl bumperguards, stainless steel wall guards, mop hanger, hose clamp hanger, 5 feet of hose.

2.7 BATHTUBS

- A. Manufacturers: Kohler, Eljer, American Standard or approved equal.
- B. White, porcelain enameled steel, acid resistant, recessed with integral apron and tiling flange, slip-resistant coating. Verify left or right hand outlet.

2.8 SHOWER ENCLOSURES

- A. Manufacturers: Fiberfab, Aquatic, InPro or approved equal.
- B. One piece gel-coated fiberglass or acrylic shower stall with stainless steel curtain rod. Curtain rod shall be minimum 6'-3" AFF (verify with architect).
- C. (ADA): One piece gel-coated fiberglass or acrylic shower stall, barrier-free with stainless steel curtain rod, folding transfer seat, stainless grab bar.
- D. Models that include a flange at the floor threshold shall be installed to conceal the flange. See part 3 for coordination and installation requirements.

2.9 DRINKING FOUNTAINS

- A. Manufacturers: Elkay, Oasis, Haws, Acorn, Murdock or approved equal.
- B. Wall hung, hi-low stations, barrier-free ADA compliant, front controls, lead-free, stainless steel basins, support arms and wall cover, safety bubbler.

2.10 ELECTRIC WATER COOLERS

- A. Manufacturers: Elkay, Oasis, Haws, Acorn, Murdock or approved equal.
- B. Self-contained, wall hung, hi-low stations, barrier-free ADA compliant, front and side controls, lead-free, 8 GPH capacity, HFC-134a refrigerant, steel cabinet, mounting bracket, stainless steel basin, safety bubbler.

2.11 FAUCET, LAVATORY

- A. Manufacturers: Chicago, Geberit, Delta HDF, Symmons or approved equal and as specifically noted below.
- B. Centerset:
 - 1. Single Handle: Polished chrome plated cast brass, deck mount, metal lever handle, ceramic mixing cartridge, temperature limit stop, 2.2 gpm aerator. Spout length, drain and hole spacing as scheduled.
 - 2. Dual Handle: Polished chrome plated cast brass, deck mount, metal indexed wristblade handles. Spout length, drain and hole spacing as scheduled.
 - 3. Sensor: Polished chrome plated cast brass, deck mount, vandal resistant aerator, DC power, adjustable distance and time delay settings. Spout length, drain and hole spacing as scheduled. Provide 120V power transformer. Chicago, Geberit or Speakman.
 - 4. Metered: Polished chrome plated brass, deck mount, vandal resistant aerator, blade handle, temperature limit stop, time limit stop, slow-closing valve. Spout length, drain and hole spacing as scheduled.

2.12 FAUCET, SINK

- A. Manufacturers: Chicago, Delta HDF, Symmons or approved equal.
- B. Swing Spout:
 - 1. Single Handle: Polished chrome plated cast brass, deck mount, metal lever handle, ceramic mixing cartridge, temperature limit stop. Spout length, drain and hole spacing as scheduled.

- C. Gooseneck:
 - 1. Dual Handle: Polished chrome plated cast brass, deck mount, metal indexed wristblade handles. Spout height, reach, drain and hole spacing as scheduled.
- 2.13 FAUCET, SERVICE
 - A. Manufacturers: T&S Brass, Chicago, Delta HDF, Symmons, or approved equal.
 - B. Wall Mount: Chrome plated brass, vacuum breaker spout with pail hook and wall brace, indexed level handles, hose thread outlet, adjustable supply arms, integral stops and supply check valves.
- 2.14 SHOWER/TUB VALVES
 - A. Manufacturers: Chicago, Delta HDF, Symmons or approved equal and as specifically noted below.
 - B. Shower: Pressure balancing valve that cycles from cold to hot, lever handle, chrome plated brass, intergral service stops, complete with shower head, arm and flange.
- 2.15 SHOWER HEADS
 - A. Manufacturers: Speakman or approved equal.
 - B. Solid brass construction, polished chrome finish, 6-jet showerhead, infinitely adjustable spray streams with operating handle, pressure-compensating auto-flow limit to 2.0 gpm.
- 2.16 SHOWER HAND SPRAY
 - A. Manufacturers: Alsons or approved equal.
 - B. Personal hand held shower with push button, on-off control, 60" double spiral metal hose, 24" stainless steel slide/grab bar, ADA adjustable slide, chrome plated vacuum breaker, chrome plated wall supply elbow.
- 2.17 HOSE BIBBS
 - A. Manufacturers: Woodford, Zurn, JR Smith or approved equal.
 - B. Interior: Bronze or brass with integral mounting flange, automatic draining, anti-siphon vacuum breaker, 3/4" hose thread, wheel handle.
 - C. Exterior (Freeze Proof Wall Box): Automatic draining, freezeless, hose connection backflow protection with two check valves, 3/4" hose thread, loose key handle, wall clamp, recessed wall box with chrome finish.
- 2.18 HOSE STATION
 - A. Manufacturers: Leonard or approved equal.
 - B. Hot & Cold: Panel-type recessed stainless steel cabinet with stainless steel cover, inlets with stops, check valves and color coded handles, outlet dial thermometer, vacuum breaker hose connection, stainless steel hose rack, [10] feet of 3/4" heavy duty EPDM hose with industrial rubber coated bronze nozzle.

2.19 HOSE REELS

- A. Manufacturers: Graco, Reelcraft or approved equal.
- B. Heavy duty type, steel construction, dual pedestal frame, powder coat finish, hand crank retractable, 3/4" inlet, 3/4" outlet, 300 psi rated.
- C. Hose: 3/4" 125 psi rated.
- D. Accessories:
 - 1. Mounting bracket and stainless steel hardware.
 - 2. Hose inlet kit.

2.20 RECESSED VALVE BOX

- A. Manufacturers: Guy Gray, Acorn, Oatey, Sioux Chief or approved equal.
- B. General: Box construction shall match fire rating of wall.
- C. Washing Machine: 2" drain socket, 3/4" hot & cold brass valves, wall brackets, face plate.
- D. Water: 1/4 turn brass ball valve with recessed wall box, wall brackets, face plate.

2.21 FIXTURE SUPPLIES

- A. Manufacturers: Brass Craft, McGuire, Chicago or approved equal.
- B. Chrome plated all brass angle stops with brass stems (no plastic). Loose key metal handle and chrome plated escutcheon. Chrome plated copper flexible supplies for exposed connections, braided supplies acceptable where concealed. Provide stop and supply type as applicable to specific fixtures. Supply shall be marked with manufacturer's name and comply with ANSI NSF 61 "No Lead".

2.22 TRAPS

- A. Manufacturers: Brass Craft, Dearborn Brass, McGuire or approved equal.
- B. Adjustable type, polished chrome plated cast brass, 17 gauge, with escutcheon. Provide type as applicable to specific fixture installation. PVC acceptable only where concealed.

2.23 LAVATORY INSULATION KIT

- A. Manufacturers: Truebro, Plumberex, McGuire or approved equal.
- B. Where lavatories or sinks have exposed traps or supplies furnish the following for ADA compliance: Safety Covers conforming to ANSI A177.1 and consisting of insulation kit of molded closed cell vinyl construction, 3/16 inch thick, white color, for insulating tailpiece, P-trap, valves, and supply piping. Furnish with weep hole and angle valve access covers, antimicrobial, with flush reusable fasteners.

2.24 CARRIERS

- A. Manufacturers: Wade, J.R. Smith, Zurn, Josam or approved equal.

- B. Water Closet: Adjustable, coated cast iron assembly with neoprene closet gasket, integral drain hub and vent, lugs for floor and wall attachment, suitable for type of closet and connecting pipe.
- C. Lavatory: Provide concealed arm carriers for all wall mounted lavatories. Coated steel uprights with welded feet, cast iron adjustable headers, concealed arms, lugs for floor and wall attachment, steel sleeves, alignment truss.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify walls and floor finishes are prepared and ready for installation of fixtures.
- B. Verify electric power is available and of correct characteristics.
- C. For all lavatories and sinks verify required number of holes and hole spacing before ordering.
- D. Verify finish floor elevation and flooring material for shower stall installation.

3.2 PREPARATION

- A. Rough-in fixture piping connections in accordance with minimum sizes indicated in fixture rough-in schedule for particular fixtures and in accordance with manufacturer's details.
- B. Locate fixtures in accordance with architectural drawings, details on structural drawings and/or Engineer's direction in field. Mount ADA fixtures according to dimensions on architectural drawings.
- C. If drain, tailpiece, strainer or other accessories are not furnished by fixture manufacturer then provide accessories by Brass Craft or approved equal.
- D. Provide vandal proof features on faucets, aerators, bubblers and pop-up waste assemblies on fixtures in public areas.
- E. Coordinate shower enclosure floor recess for ADA threshold height or hidden mounting flange on polished concrete floors.

3.3 INSTALLATION

- A. Install shut-off valves on water lines servicing a fixture group.
- B. Support piping at stop, valve or flush valve.
- C. Align fixtures and equipment installed in accord with architectural drawings.
- D. Locate shower head mounting height 80" minimum from drain to centerline of head pipe.
- E. Locate shower curtain rod minimum 6'-3" AFF (verify with architect).
- F. Locate floor service sink (mop sink) faucet rough-in at 36" AFF.
- G. Locate water recessed valve boxes for refrigerators at 18" AFF.

- H. Locate water recessed valve boxes for coffee makers per architectural plans.
- I. Seal fixtures to wall and floor surfaces with silicon sealant, color to match fixture.
- J. Solidly attach water closets to floor with lag screws. Lead flashing is not intended hold fixture in place.
- K. For ADA accessible water closets, install flush valve with handle to wide side of stall.
- L. For ADA showers, recess shower enclosures into floor to obtain required accessible threshold dimension. Coordinate with architect on finish floor material and height. Provide the threshold with a finished appearance.
- M. For showers installed on polished concrete floors, recess tile flange into floor for a finished threshold appearance.
- N. Provide grout bedding beneath shower pans, shower enclosures and floor mounted mop sinks. Bedding shall support base of fixture and provide level installation.

3.4 INTERFACE WITH OTHER PRODUCTS

- A. Review millwork shop-drawings. Confirm location and size of fixtures and openings before rough in and ordering.

3.5 ADJUSTING

- A. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.
- B. Adjust flush lever or valve for intended flow rate and operation.

END OF SECTION

SECTION 23 00 00 - HVAC GENERAL CONDITIONS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Conform to General Conditions, Supplementary Conditions, the modifications thereto and Division 01 - General Requirements for all work in Division 23.

1.2 SUMMARY

- A. Provide labor, materials and appliances necessary for satisfactory installation of mechanical work ready to operate in strict accordance with these specifications and drawings. Work of Division 23 includes, but is not limited to, that as delineated in the following specification sections:

23 00 00	HVAC General Conditions
23 05 00	Common Work Results for HVAC
23 05 93	Testing, Adjusting and Balancing
23 07 00	HVAC Insulation
23 08 00	Project Commissioning (by Commissioning Agent)
23 09 00	Instrumentation and Control for HVAC
23 23 00	Refrigerant Piping
23 31 00	HVAC Ducts and Casings
23 33 00	Air Duct Accessories
23 34 00	HVAC Fans
23 37 00	Air Outlets and Inlets
23 38 00	Hoods
23 40 00	HVAC Filters
23 72 00	Energy Recovery Units
23 74 00	Outdoor Air-Handling Units
23 74 23	Outdoor Makeup Air Handling Units
23 81 43	Air-Cooled, Variable Refrigerant Flow, Multi-Unit Heat Pump
23 83 23	Electric Terminal Heating Units

1.3 CODES AND STANDARDS

- A. Conform to following code and agency requirements having jurisdictional authority over mechanical installation.
 - 1. Uniform Plumbing Code (UPC) with local amendments.
 - 2. International Mechanical Code (IMC) with local amendments.
 - 3. International Building Code (IBC) with local amendments.
 - 4. International Fuel Gas Code (IFGC) with local amendments.
 - 5. National Electrical Code (NEC) NFPA 70.
 - 6. Requirements of OSHA and EPA.
 - 7. National Fire Protection Association (NFPA) Codes and Standards.
 - 8. ASME code for construction of pressure vessels.
 - 9. American Gas Association (AGA) Standards.
 - 10. ASTM, ANSI and NEMA standards, as referenced in subsequent sections.
 - 11. Local Sewer District Requirements.
 - 12. Local Water District Requirements.
 - 13. Local Health Department Requirements.
 - 14. Washington State Energy Code.

1.4 PERFORMANCE REQUIREMENTS

- A. Firestopping: Conform to International Building Code with local amendments, FM, and UL for fire resistance ratings and surface burning characteristics.
- B. Provide vibration isolation on motor driven equipment over 0.5 hp, plus connected piping and ductwork.
- C. Provide minimum static deflection of isolators for equipment as follows:
 - 1. 5 hp and less: 1 inch
- D. Maintain rooms below the maximum sound levels, as defined by ASHRAE Handbook *HVAC Applications* and ANSI S1.8.

1.5 PRODUCT SUBSTITUTIONS

- A. Manufacturers and models of equipment and material indicated herein and on drawings are those upon which mechanical design is based. Other manufacturers with products considered equal in general quality may be listed without specific model designation. Manufacturers not listed shall be submitted for approval, see Division 01.
- B. Substitutions will be evaluated based on product manufacturer only. Specific product model, specifications, options and accessories will be evaluated during submittals. Approval of a manufacturer substitution does not constitute approval of the submitted product.
- C. Any equipment other than the basis of design is considered a substitution.
- D. In selecting substitute equipment, the Contractor is responsible for and shall guarantee equal performance and fit. Cost of redesign and all additional costs incurred to accommodate the substituted equipment shall be borne by the Contractor.
- E. Unless indicated otherwise, "or approved" may be assumed for all products in Division 23.

1.6 SUBMITTALS

- A. Provide one electronic copy of product data submittals for all products listed under “Part 2 Products” of Division 23 and all additional products noted on drawings or required for completion of sequence of operations.
- B. Electronic: **All sections of Division 23 shall be submitted together in one complete PDF file with bookmarks for each section. Multi-part submittals will be returned without review.**
 - 1. First Page: Name of Project, Owner, Location & Contracting Company.
 - 2. Index Page: List of specification sections with contents by Tag or item.
 - 3. Bookmarks: Electronic bookmark of each specification section corresponding to listing in index.
- C. Clearly indicate on each page the equipment schedule designation (Tag) and/or specification section, as applicable. Indicate selected model and all accessories intended for use.
- D. Equipment vendor cover page with contact information shall precede submittal by that vendor.
- E. Submitted product information shall include (as applicable) but not be limited to the following information:
 - 1. Product description
 - 2. Manufacturer and model
 - 3. Dimensions
 - 4. Performance Ratings (i.e. capacity, rpm, HP, temperature)
 - 5. Construction Materials
 - 6. Ratings (i.e. UL, ASTM, NEMA, etc)
 - 7. Electrical data
 - 8. Sound level data (corresponding to scheduled values)
 - 9. Vibration Isolation
 - 10. Controls and wiring diagrams
 - 11. Accessories
 - 12. Engineering technical data (i.e. pressure drops, leakage rates, pump curves, fan curves)
- F. Air Terminal Product Data: Submit data indicating configuration, general assembly, and materials used in fabrication. Include catalog performance ratings indicating airflow, static pressure, heating coil capacity and NC designation. Include electrical characteristics and connection requirements. Include schedules listing discharge and radiated sound power level for each of second through sixth octave bands at inlet static pressures of 1 inch to 4 inches wg.
- G. If requested by Architect or Engineer, submit Manufacturer's Installation Instructions on any equipment, procedures, or certifications so requested.
- H. Do no ordering, fabrication or manufacturing of products until return of approved submittals.

1.7 SHOP DRAWINGS

- A. The Contractor shall submit drawings and/or diagrams for review and for job coordination in all cases where deviation from the Contract Drawings are contemplated because of job

conditions, interference, or substitution of equipment, or when requested by the Engineer for purposes of clarification of the Contractor's intent.

- B. Submit detailed drawings, rough-in sheets, etc., for all special or custom-built items or equipment. Drawings and details under the section shall include (but not be limited to) the following, where applicable to this project:
 - 1. Electrical interlock wiring diagrams.
 - 2. Piping layout plans and interference details.
- C. By submission of piping and ductwork shop drawings, the Contractor acknowledges that coordination has been done to ensure that all piping and ductwork fits and that no conflicts exist.
- D. The Architect's review of shop drawings shall not relieve the Contractor of responsibility for deviations from the Contract drawings or specifications, unless he has, in writing, called the attention of the Architect to such deviations at the time of the submission, nor shall it relieve him from responsibility for errors or omission in such shop drawings.
- E. Piping Shop Drawings: Submit one PDF copy of hydronic piping system for approval prior to beginning work, drawn to scale not smaller than 1/8 inch equals 1 foot, including equipment, critical dimensions, flexible connectors, expansion joints and sizes.
- F. Ductwork Shop Drawings: Submit one PDF copy of duct fabrication drawings for approval prior to beginning work, drawn to scale not smaller than 1/8 inch equals 1 foot, indicating:
 - 1. Fabrication, assembly, and installation details, including plans, elevations, sections, details of components, and attachments to other work.
 - 2. Duct layout, indicating pressure classifications and sizes in plan view.
 - 3. Fittings.
 - 4. Reinforcing details and spacing.
 - 5. Seam and joint construction details.
 - 6. Penetrations through fire rated and other walls.
 - 7. Terminal unit, coil, and humidifier installations.
 - 8. Hangers and supports, including methods for building attachment, vibration isolation, and duct attachment.
 - 9. Indicate shop fabricated assemblies including volume control dampers and duct access doors.
 - 10. Indicate size and configuration of fan assembly, mountings, weights, ductwork and accessory connections.

1.8 COMMISSIONING

- A. See Division 01 and Section 23 08 00 for roles and responsibilities of commissioning.
- B. Provide all necessary commissioning assistance, equipment and documentation as required by the Commissioning Plan.
- C. The duty and responsibility for mechanical commissioning work shall be assigned to a specific individual. Inform the General Contractor and Certified Commissioning Professional (CCXP) of the contact information for the person so assigned.
- D. Perform corrective actions needed to resolve deficiencies identified during commissioning. Record action taken on commissioning deficiency log.

1.9 HVAC PERMIT

- A. HVAC contractor shall prepare all documents for mechanical permit application, submit for, and obtain the permit. HVAC Contractor shall pay all costs and fees to obtain the permit.
- B. Contractor shall not commence work until permit is obtained. Contractor is solely responsible to ensure that the permit application and any revisions are submitted in a timely manner so as not to impact project schedule.
- C. Permit documents may include (but are not limited to) the following:
 - 1. Mechanical Site Plan, Vicinity Map and Elevations.
 - 2. Mechanical Load Calculations (Mechanical Consultant will provide load calculations to the Contractor).
 - 3. Acoustical Reports. Mechanical Contractor shall obtain the required acoustical reports from the acoustical engineer for the project.
 - 4. Energy Compliance Forms.
- D. Contractor shall retain services of a third-party structural engineer to provide support, anchoring and seismic calculations for all applicable equipment.

1.10 QUALITY ASSURANCE

- A. Perform Work in accordance with ASME B31.9 – Building Services Piping for installation of piping systems and ASME Section IX – Welding and Brazing Qualifications for welding materials and procedures.
- B. Perform Work in accordance with the International Mechanical Code including State and local amendments.
- C. Provide products requiring electrical connections listed and classified by UL as suitable for purpose specified and indicated.
- D. Perform Work in accordance with Washington State Energy Code.

1.11 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years' experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years' experience.

1.12 SEQUENCING

- A. Sequence balancing between completion of systems tested and Date of Substantial Completion.

1.13 SCHEDULING

- A. Schedule and provide assistance in final adjustment and test of life safety system with Fire Authority.

1.14 DELIVERY, STORAGE, AND HANDLING

- A. Accept materials on site in original factory packaging, labeled with manufacturer's identification.
- B. Protect all equipment, materials, and insulation from weather, construction traffic, dirt, water, chemicals, and damage by storing in original packaging and under cover. Where original packaging is insufficient, provide additional protection. Maintain protection in place until installation.
- C. Inspect all products and materials for damage prior to installation.
- D. Protect piping from all entry of foreign materials by providing temporary end caps or closures on piping and fittings. Furnish temporary protective coating on cast iron and steel valves.
- E. Protect heat exchangers and tanks with temporary inlet and outlet caps. Maintain caps in place until installation.
- F. Protect dampers from damage to operating linkages and blades.
- G. Protect materials and finishes during handling and installation to prevent damage.
- H. Protect coil fins from crushing and bending by leaving in shipping cases until installation, and by storing indoors. Protect coils from entry of dirt and debris with pipe caps or plugs.
- I. Comply with manufacturer's installation instruction for rigging, unloading and transporting units.
- J. Comply with contractor's construction Indoor Air Quality (IAQ) Plan.

1.15 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply fire stopping materials when temperature of substrate material and ambient air is below 60 degrees F. Maintain this minimum temperature before, during, and for minimum 3 days after installation of fire stopping materials.
- B. Provide ventilation in areas to receive solvent cured materials.
- C. Do not install underground piping, tanks, or tank foundations when bedding is wet or frozen.
- D. Install insulation only when ambient temperature and humidity conditions are within range recommended by manufacturer. Maintain temperature during and after installation for minimum period of 24 hours.
- E. Do not install instruments when areas are under construction, except rough in, taps, supports and test plugs.
- F. Do not install duct sealant when temperatures are less than those recommended by sealant manufacturers. Maintain temperatures during and after installation of duct sealant.
- G. Maintain water integrity of roof during and after installation of chimney or vent.
- H. Do not install condensing unit foundation pad when ground is frozen or muddy.

1.16 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.
- B. Verify by field measurements, sizes and configurations are compatible with wall construction and layout.
- C. Existing systems and utility lines indicated on drawings are in accordance with information furnished to the Architect and may not be complete. Contractor is responsible for locating, uncovering, disposing of or maintaining existing systems.

1.17 COORDINATION

- A. Visit the site and become familiar with existing conditions affecting work.
- B. Verify locations of any overhead or buried utilities on or near site. Determine such locations in conjunction with all public and private utility companies and with all authorities having jurisdiction.
- C. Existing systems and utility lines indicated on drawings are in accordance with information furnished to the Architect and may not be complete. Contractor is responsible for locating, uncovering, disposing of or maintaining existing systems.
- D. HVAC drawings are diagrammatic and do not indicate all possible site conditions. The contractor shall verify all measurements, dimensions and connections on site and coordinate between trades to preclude interferences. The contractor shall provide adjustments to piping or ductwork as necessary to fit conditions including but is not limited to relocation, offsets, and transitions.
- E. In the event of a conflict with other trades of work, the following priority from highest to lowest shall be followed: Structural, lighting, HVAC, plumbing/piping and sprinklers. Starting with the lowest priority, the HVAC, plumbing, and sprinkler contractors shall provide whatever materials, offsets, labor etc. is required to resolve the conflict.
- F. When discrepancies occur between plans and specifications, the Architect will determine which takes precedence and the Contractor shall perform the selected requirement at no additional cost.
- G. Prior to ordering equipment cross-check mechanical and electrical drawings and specifications to assure proper location and electrical characteristics of connections serving mechanical and electrical equipment.
- H. Advise the Architect of any modifications required to suit equipment furnished. Costs for modifications due to equipment substitution will be borne by the contractor.
- I. Wherever conflicts occur between different parts of the Contract Documents the greater quantity, the better quality, or larger size shall prevail unless the Architect informs the Contractor otherwise in writing.
- J. The scale of each drawing is relatively accurate, but the Contractor is warned to obtain the necessary dimensions for any exact takeoffs from the Architect. No additional cost to the Owner will be considered for failure to obtain exact dimensions where not clear or in error on the drawings. Any device or equipment roughed in improperly and not positioned on implied centerlines or as required by good practice shall be repositioned at no cost to the Owner.

- K. Where the word 'verify' is used on the documents, the contractor shall field verify the existing conditions and modify the scope of the installation as required to meet the verified conditions without additional cost to the Owner.
- L. Filter installation shall be coordinated with the building flush-out.
- M. Coordinate trenching, excavating, bedding, backfilling of buried systems with requirements of this specification.
- N. Coordinate wall openings, piping rough-in locations, concrete housekeeping pads, and electrical rough-in locations to accommodate Work of this Section.
- O. Coordinate all equipment with building control work.
- P. Coordinate installation of
 - 1. Condensing units with concrete pad and roof structure.
 - 2. Air handling units with building structure.
 - 3. Unit installation with roof structure, piping systems, and ceiling for unit access.
 - 4. Roof curbs with roof structure, roof deck and roof membrane installation.

1.18 CUTTING, FITTING, REPAIRING AND PATCHING

- A. Arrange and pay for all cutting, fitting, repairing, patching and finishing of work by other trades where necessary for installation of mechanical work. Perform work only with craftsmen skilled in their respective trades.
- B. Avoid cutting, where possible, by setting sleeves, frames, etc., and by coordinating for openings in advance. Assist other trades in securing correct location and placement of rough-frames, sleeves, openings, etc. for ducts and piping.
- C. Cut all holes neatly and as small as possible to admit work. Perform cutting in manner so as not to weaken walls, partitions or floors. Drill holes required to be cut in floors without breaking out around holes.

1.19 SALVAGE

- A. Remove excess piping and ductwork, plug or cap any unused branch connections. Remove scrap pipe and all other excess materials from the site.
- B. Comply with contractor's Construction Waste Management Plan.

1.20 ELECTRICAL

- A. Short-Circuit Current Rating (SCCR): All HVAC and refrigeration equipment with multi-motor or combination electrical loads shall comply with NEC 110.10 & 440.4 and must include a SCCR greater than the Available Interrupting Current (AIC) of the electrical circuit serving the equipment. See electrical drawings for required AIC kA rating. Equipment SCCR may be presented in writing from the manufacturer or shown on the unit nameplate. Refrigeration or air-conditioning equipment over 60 Amps MOCP must list the SCCR on the unit nameplate. If the AIC rating is unavailable or cannot be determined provide equipment with a minimum SCCR of 10kA.
- B. Motor Starters: By mechanical equipment manufacturer where factory mounted controls are provided. Variable frequency drives by Division 23, all other starters provided by Electrical Contractor.

- C. Power Wiring: By Electrical Contractor.
- D. Control Wiring: Responsibility of Division 23, including all line and low voltage control wiring. Owner will not entertain additional cost due to lack of coordination between HVAC Contractor and Electrical Contractor.

1.21 EXTRA MATERIALS

- A. Furnish
 - 1. Two packing kits for each size and valve type.
 - 2. One set of mechanical seals for each pump.
 - 3. Two refrigerant oil test kits each containing everything required for conducting one test.
 - 4. Three sets of disposable filters for each unit.
 - 5. One set of fan belts for each unit.

1.22 PROJECT CLOSEOUT

- A. Completion, submission and approval of the following is required for final project closeout.
 - 1. Execution of Architect's and Engineer's final observation reports (punchlist)
 - 2. Operating and Maintenance Instructions
 - 3. Operating and Maintenance Manual
 - 4. Equipment and Pipe Cleaning
 - 5. Record Drawings
 - 6. Testing
 - 7. Commissioning
 - 8. Warranty
- B. See Division 01 for additional requirements.

1.23 OPERATING AND MAINTENANCE INSTRUCTIONS

- A. General: In addition to requirements of Division 01, following initial operation of HVAC systems and prior to acceptance by the Architect, perform the following services.
- B. At least two weeks prior to each instruction period, give written notification of readiness to proceed to the Architect and Owner, and obtain mutually acceptable dates.
- C. Conduct demonstrations and instructions for the Owner's representatives, pointing out requirements for operating, servicing and maintaining equipment and systems. Describe general system operation and specific equipment functions. Cover all equipment calibration, setpoint adjustment, safeties and alarms.
- D. Furnish qualifications of Contractor's personnel in charge of the instruction; foreman position is minimum acceptable. Where equipment startup is performed by supplier's or manufacturer's personnel, those personnel should also provide training on that equipment.
- E. During demonstrations and instructions include and reference information from maintenance manuals and contract drawings.
 - 1. Provide documentation of all instruction which includes:
 - a. Date and time of instruction
 - b. Name, affiliation and qualifications of the instructor
 - c. Name and affiliation of the attendees

- d. Topics, systems, and equipment covered
 - e. Length of instruction
- F. Minimum duration of instruction periods:
- 1. HVAC Systems TBD
 - 2. Control Systems TBD
 - 3. Energy Metering TBD

1.24 OPERATING AND MAINTENANCE MANUALS

- A. Contents: Furnish, in accord with Division 1, one PDF and one bound copy of operating and maintenance manuals to include the following:
- 1. Manufacturers, suppliers, contractor names, addresses and phone numbers.
 - 2. Warranty service contractors' names, address and phone numbers (if different from above).
 - 3. Schedule and description of routine maintenance for each component to include oiling, lubrication and greasing data.
 - 4. Manufacturer's cuts and rating tables, including brochures for all submittal items.
 - 5. Part numbers of all replaceable items.
 - 6. Control diagrams and operation sequence.
 - 7. Written guarantees.
 - 8. Record drawings corrected and completed.
 - 9. Completed equipment start-up forms and checklists.
 - 10. Final copy of testing, adjusting, and balancing report.
- B. Operation and Maintenance Data:
- 1. Include, spare parts lists, exploded assembly views for all equipment.
 - 2. Submit installation instructions, adjustment instructions, spare parts lists, exploded assembly views for all equipment.
 - 3. Submit inspection period, cleaning methods, recommended cleaning materials, and calibration tolerances.
 - 4. Submit manufacturer's descriptive literature, operating instructions, and maintenance and repair data. Include directions for resetting constant volume regulators.
- C. Filters: Operation and Maintenance Data: Submit instructions for operation, changing, and periodic cleaning.
- D. Binders:
- 1. Furnish typewritten or printed index and tabbed dividers between principal categories.
 - 2. Bind each manual in a hard-backed loose-leaf binder.
- E. Imprint on cover:
- 1. Name of project.
 - 2. Owner.
 - 3. Location of project.
 - 4. Architect.
 - 5. Contractor.
 - 6. Year of completion.
- F. Imprint on backing:
- 1. Name of project.
 - 2. Year of completion.

- G. Submittals:
 - 1. Preliminary Copies: Prior to scheduled completion of the project, submit one PDF copy for review by the Architect.
 - 2. Final Copies: After approval of the preliminary copy, submit one PDF and one bound copy to the Owner.

1.25 EQUIPMENT AND PIPE CLEANING

- A. Clean interior and exterior of all equipment. Equipment shall be free of dirt, construction debris, corrosion, etc.
- B. Adequate provisions shall be made during construction to eliminate dirt, debris or other material from entering and collecting inside of pipe, ductwork and equipment. Any collection of material shall be thoroughly cleaned before equipment startup and if necessary again before owner occupancy.
- C. Clean exterior of all exposed pipe and ductwork.

1.26 RECORD DRAWINGS

- A. Submit one digital file with all drawings in PDF format.
- B. Make all notes and revisions on PDF set in red.
- C. Show location of equipment, location and size of piping, location and size of ductwork. Locate all valves, control dampers and similar equipment with tag or label identification. Indicate locations and elevations of exterior pipe and utility connections. Maintain continuously updated drawings during progress of project.
- D. Record actual locations of tagged valves and control dampers; include valve tag numbers. Record actual locations of flexible connectors and expansion joints.
- E. Record actual locations of equipment, clean-outs, controlling devices, and all above grade, under-floor, and buried piping and ductwork. Provide dimensions from gridline or walls to indicate specific locations.

1.27 TESTING

- A. Provide completed start-up forms and checklists.
- B. Perform testing and balancing of HVAC systems as described in this Division and as required by applicable codes and ordinances.
- C. Provide changes in sheaves, belts, and dampers as required for correct balance.
- D. Provide commissioning of Control System, and all mechanical components in compliance with the applicable Energy Code, the commissioning notes on the drawings and commissioning specifications of this Division. Written verification of test to be signed by Owner's Representative

1.28 WARRANTIES AND CONTRACTOR'S GUARANTEE

- A. All work, material and equipment shall be free of defect, complete and in perfect operating order at time of delivery to Owner.

- B. Furnish one year warranty from date of substantial completion for all systems unless specifically noted otherwise.
- C. Without cost to Owner, **correct all defects and failures discovered within one year from date of final acceptance**, except when in the opinion of the Architect a failure is due to neglect or carelessness of the Owner.
- D. The guarantee of the Contractor is independent of shorter time limits by any manufacturer of equipment furnished. Submit with Operation and Maintenance Manual all guarantees which exceed one year.
- E. Make all necessary balancing and control adjustments during first year of operation.
- F. The presence of any inspector or observer during any construction does not relieve the Contractor from responsibility for defects discovered after completion of the work.

PART 2 **NOT USED**

PART 3 **EXECUTION**

3.1 DOCUMENTATION

- A. Additional plan submittals to reviewing authority: If additional drawing submittals are required at any time during construction contractor shall submit drawings, review with authority, and pick up subsequent approved drawings. Engineer will revise and/or prepare drawings for submittal.

3.2 INSPECTION

- A. Do not allow any work to be covered up or enclosed until inspected, tested and approved by the Architect and all authorities having jurisdiction over the work.
- B. Should any work be enclosed or covered up before such inspection and test, Contractor shall at his own expense uncover work, and after it has been inspected, tested and approved, make all repairs as necessary to restore all work disturbed by him to its original condition.
- C. Energy Code C104 specifically requires the following inspections.
 - 1. Mechanical Equipment Efficiency and Economizer: To be made after all equipment and controls required by the Energy Code and this specification are installed and prior to the concealment of such equipment or controls.
 - 2. Mechanical Pipe and Duct Insulation: To be made after all pipe and duct insulation is in place, but before concealment.
 - 3. Motor Inspections: To be made after installation of all equipment covered by the Energy Code and this specification but before concealment.

3.3 FIELD QUALITY CONTROL

- A. Inspect isolated equipment after installation for proper movement clearance.

3.4 CLEANING

- A. Clean adjacent surfaces of fire stopping materials.

- B. Clean ductwork and equipment.

3.5 MANUFACTURER'S FIELD SERVICES

- A. Where PEX tubing or seismic joints are installed, furnish inspection services by manufacturer's representative and certify installation is in accordance with manufacturer's recommendations and equipment is performing satisfactorily.

3.6 PROTECTION OF FINISHED WORK

- A. Protect adjacent surfaces from damage by material installation.

END OF SECTION

SECTION 23 05 00 - COMMON WORK RESULTS FOR HVAC

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Hangers and Supports.
 - 2. Expansion Fittings and Loops.
 - 3. Vibration and Seismic Controls.
 - 4. Firestopping.
 - 5. Condensate Pumps
 - 6. Access Panels
 - 7. Tags and Identification.
 - 8. Execution

1.2 GENERAL REQUIREMENTS

- A. Comply with requirements and recommendations of Manufacturers Standardization Society of the Valve and Fittings Industry (MSS) Standards SP-58 and SP-69.
- B. Comply with requirements and recommendations of Sheetmetal and Air Conditioning Contractors National Association (SMACNA) HVAC Duct Construction Standards.
- C. Conform to requirements of IBC 1613 and SMACNA "Seismic Restraint Manual Guidelines for Mechanical Systems".

1.3 MATERIALS AND EQUIPMENT

- A. Where two or more units of same class of equipment are required, use products of a single manufacturer. All equipment shall be new and free from damage.
- B. Protect stored material and equipment against weather, corrosion and dirt. Protect installed mechanical components, including but not limited to piping, ductwork, and equipment against weather damage, corrosion, dirt and construction dust. Seal equipment and ductwork where and when necessary to be kept clean.
- C. Provide major equipment components with manufacturer's name, address, catalog number and capacity indicated on a nameplate, securely affixed in a conspicuous place.
- D. Furnish standard and fabricated hangers and supports complete with necessary inserts, bolts, nuts, rods, washers and other accessories.

1.4 REQUIREMENTS

- A. Provide incompressible inserts and shields at all piping supports on pipe to be insulated per 23 07 00.
- B. Provide vibration isolation on motor driven equipment, plus connected piping.
- C. Provide structural work and equipment required for expansion and contraction of piping. Verify anchors, guides, and expansion joints provide and adequately protect system.
- D. Firestopping Materials: Provide to achieve fire ratings as noted on architect's drawings for adjacent construction, but not less than 1 hour fire rating. ASTM and UL.

1. Ratings may be 3-hours for firestopping in through-penetrations of 4-hour fire rated assemblies unless otherwise required by applicable codes.
 2. Surface Burning: UL 723 with maximum flame spread / smoke developed rating of 25/50.
 3. Firestop interruptions to fire rated assemblies, materials, and components.
- E. Prevent contact between dissimilar metals, such as copper tubing and steel, by use of copper-plated, plastic coated, or flexible materials. All supports which contact copper tubing shall be copper plated.
- F. Firestop interruptions to fire rated assemblies, materials and components.

1.5 QUALITY ASSURANCE

- A. Installed products shall have surface Burning Characteristics: 25/50 flame spread/smoke developed index when tested in accordance with ASTM E84.
- B. Perform work in accordance with local jurisdiction's requirements and AWS D1.1 for welding hanger and support attachments to building structure.
- C. Conform to ASME A13.1 for color scheme for identification of piping systems and accessories.

PART 2 PRODUCTS

2.1 DUCT HANGERS AND SUPPORTS

- A. Hanger straps and rods shall be in accord with SMACNA Duct Construction Standards.
- B. Fasten bracing to ductwork, including riveting, bolting, and tack welding per SMACNA.
- C. Provide galvanized steel band or fabricated angle iron brackets for wall supports.
- D. Exposed ducts shall be supported/anchored to structure at closer spacing and using heavier materials, wherever so indicated on drawings.
- E. Hanger Rods: Carbon Steel, with hex nuts and flat washers.
- F. Concrete Inserts:
 1. Continuous channel - Unistrut or approved.
 2. Universal, malleable iron - Type 18, FS WW-H-171.
- G. Beam Clamps and Attachments as required.

2.2 PIPE HANGERS AND SUPPORTS

- A. Provide hangers and supports with incompressible insulation inserts and shields for all piping to be insulated per 230700.
 1. Manufacturer: Pipe Shields, INC or approved equal.
 2. Material: Calcium Silicate or Uretherne per temperature application.
 3. Thickness: Insert thickness shall match required insulation thickness per 230700.
- B. Refrigerant Piping:
 1. Hangers for rigid pipe: Carbon steel, adjustable swivel, split ring with Armacell Armafix insulated rigid insert.

2. Hangers for flexible pipe: Carbon steel, adjustable, clevis with Armacell Armafix insulated rigid insert and saddle.
3. Hangers for paired flexible pipe: Carbon steel, adjustable, clevis with 1" wide overlapping steel band and saddle.

2.3 HANGER ACCESSORIES

- A. Hanger Rods: Mild steel threaded both ends, threaded on one end, or continuous threaded.

2.4 ACCESS PANELS

- A. Milcor or approved equal.
- B. Include an allowance for a minimum of 12 access panels.
- C. Architectural grade, 14 guage frame and door, painted steel or stainless steel based on application.

2.5 UNIONS AND FLANGES

- A. Unions for Pipe 2 inches and Smaller:
 1. Ferrous Piping: Class 150, 300 psi CWP, malleable iron, threaded.
 2. Copper Piping: Class 150, 300 psi CWP, bronze unions.
 3. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.
 4. PVC Piping: PVC.
 5. CPVC Piping: CPVC.
- B. PVC Pipe Materials: For connections to equipment and valves with threaded connections, furnish solvent-weld socket to screwed joint adapters and unions, or Schedule 80 threaded PVC pipe (ASTM D2464).

2.6 FLEXIBLE PIPE CONNECTORS

- A. Manufacturers: Metraflex, Mason or approved equal.
- B. Braided Stainless Steel (Pump Connection)
 1. 304 Stainless Steel flexible hose, close pitch, annular corrugated.
 2. 304 Stainless Steel double braided outer covering.
 3. ANSI Class 150 carbon steel flanges.
- C. Steel Piping: Victaulic Style 177, 77, or W77 flexible couplings may be used in lieu of flexible connectors for vibration isolation at equipment connections. Three (3) couplings, for each connector, shall be placed in close proximity to the source of vibration.
- D. Braided Stainless Steel (Coil Connection)
 1. 304 Stainless Steel flexible hose, close pitch, annular corrugated.
 2. 304 Stainless Steel double braided outer covering.
- E. Rubber Sphere
 1. Molded neoprene and nylon construction with internal steel wire.
 2. Integral cable restraints.
 3. One piece, free-floating, ANSI Class 150 galvanized steel flanges.

2.7 FLASHING

- A. Metal Flashing: 26 gage thick galvanized steel.
- B. Metal Counterflashing: 22 gage thick galvanized steel.
- C. Lead Flashing:
 - 1. Waterproofing: 5 lb./sq. ft sheet lead.
 - 2. Soundproofing: 1 lb./sq. ft sheet lead.
- D. Flexible Flashing: 47 mil thick sheet butyl; compatible with roofing.
- E. Caps: Steel, 22 gauge minimum; 16 gauge at fire resistant elements.

2.8 EQUIPMENT CURBS

- A. Manufacturers' curbs where indicated on drawings.
- B. Fabricated: Welded 18 gage galvanized steel shell and base, mitered 3-inch cant, variable step to match roof insulation, 1-1/2 inch thick insulation, wood nailer.

2.9 EQUIPMENT RAIL SUPPORTS

- A. Manufacturers: Greenheck GESR or approved equal.
- B. Prefabricated insulated galvanized steel equipment support. 4, 6 or 8 inch width, select based on equipment supported. Provide with same coating as fan, otherwise Polyester Urethane. Select height based on roofing and insulation requirements. Select length based on equipment supported.

2.10 SLEEVES

- A. Sleeves for Pipes Through Non-fire Rated Floors: 18 gage thick galvanized steel.
- B. Sleeves for Pipes Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Steel pipe or 18 gage thick galvanized steel.
- C. Sleeves for Ductwork: 18 gage thick galvanized steel.
- D. Sealant: Acrylic
- E. Size large enough to allow for movement due to expansion and to provide for continuous insulation or installation of fire sealant at fire-rated walls. Note that insulation is discontinuous at fire walls.

2.11 MECHANICAL SLEEVE SEALS

- A. Manufacturers: Metraflex Metraseal, Thunderline Link-Seal or approved equal.
- B. Product Description: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

2.12 MECHANICAL FIRESTOPPING SLEEVE SEALS

- A. Manufacturers: Metraflex Metraseal 120 or approved equal.
- B. Product Description: Modular mechanical type, consisting of interlocking intumescent synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation. UL listed for 2 hour fire protection.

2.13 FORMED STEEL CHANNEL

- A. Manufacturers: Allied Tube & Conduit, B-Line Systems, Unistrut or approved equal.
- B. Product Description: Galvanized 12 gage thick steel, with holes 1-1/2 inches on center.

2.14 SUPPORT ACCESSORIES

- A. Pipe Alignment Guides: Two piece welded steel with enamel paint, bolted, with spider to fit standard pipe, frame with four mounting holes, clearance for minimum 1 inch thick insulation, minimum 3 inch travel.
- B. Swivel Joints: Steel / Bronze body, double ball bearing race, field lubricated, with rubber (Buna-N) o-ring seals.
- C. General: Provide a complete UL listed system of heating cables, components and control for preventing pipes from freezing.
- D. Cable: Self-regulating cable with nickel-copper bus wires embedded in conductive polymer core with dielectric polyolefin jacket, braided tinned copper ground and outer jacket of polyolefin. Cable shall vary power output in response to temperature all along its length with a self-regulating factor of at least 90%.
- E. Components: Control enclosures shall be NEMA 4X rated. Connection system shall not require stripping of wires.
- F. Control: Thermostatic control with ambient sensor set at 40 F.
- G. Installation:
 - 1. Apply "Electric Traced" labels to outside of insulated pipe.
 - 2. Attached cable to metal pipe with glass cloth tape and plastic pipe with aluminum tape.
 - 3. Adjust pipe insulation size to accommodate maintenance tape.
 - 4. Follow manufacturer's installation instructions.

2.15 FIRESTOPPING-APPLIED

- A. Manufacturers: RectorSeal, Dow Corning, 3M Fire Protection or approved equal.
- B. General:
 - 1. Fire stopping materials shall conform to Flame (F) and Temperature (T) ratings as required by applicable building codes and tested by nationally accepted test agencies per ASTM E 814 or UL 1479 fire tests for through penetrations, and ASTM E 1966 or UL 2079 for construction joints, and UL 2307 for perimeter edge joints.
 - 2. Fire stopping material shall be free of asbestos, PCBs, ethylene glycol, and lead.

3. Do not use any product containing solvents or that requires hazardous waste disposal.
 4. Fire stopping shall be performed by a contractor trained or approved by firestop manufacturer.
 5. Select products with rating not less than rating of wall or floor being penetrated.
- C. Single Source Responsibility: Provide firestop systems for all conditions from a single supplier.
- D. Product Description: Provide Latex caulk/sealant, Silicone caulk/sealant, Intumescent Wrap Strip, Firestop Putty, Firestop Collar or Intumescent Sleeve to meet each specific application and performance requirement.
- E. Primer: Type recommended by firestopping manufacturer for specific substrate surfaces and suitable for required fire ratings.
- F. Installation Accessories: Provide clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.
1. Forming/Damming Materials: Mineral fiberboard, backer rod or other type recommended by Manufacturer's tested system.
- 2.16 PENETRATIONS OF NON-RATED SURFACES
- A. Stamped steel, chrome plated, hinged, split ring escutcheons or floor plates or ceiling plates for covering openings in occupied areas where piping is exposed.
 - B. For exterior wall openings below grade, furnish mechanical sealing device to continuously fill annular space between piping and cored opening or water-stop type wall sleeve.
- 2.17 CONDENSATE PUMP
- A. Manufacturer: BlueDiamond MaxiBlue or approved equal.
 - B. Rotary elastomer diaphragm technology, 3.7 gal/hr, 23 feet hd, 16.5 feet lift, 21 dba. Thermistor level sensing. Capable of running dry. Provide with reservoir and accessories.
- 2.18 CONDENSATE OVERFLOW SWITCH
- A. Manufacturer: Rectorseal Safe-T-Switch or approved equal.
 - B. Sealed, waterproof reed/magnet float switch installed on the overflow outlet of drain pans or on an auxiliary drain pan. UL 508, 24 volt AC.
- 2.19 INERTIA BASES
- A. Structural Bases:
 1. Design: Sufficiently rigid to prevent misalignment or undue stress on machine, and to transmit design loads to isolators and snubbers.
 2. Construction: Welded structural steel with gusset brackets, supporting equipment and motor with motor slide rails.
 - B. Concrete Inertia Bases:
 1. Mass: Minimum of 1.5 times weight of isolated equipment.

2. Construction: Structured steel channel perimeter frame, with gusset brackets and anchor bolts, adequately reinforced, concrete filled.
3. Connecting Point: Reinforced to connect isolators and snubbers to base.
4. Concrete: Reinforced 3,000 psi concrete.

2.20 VIBRATION ISOLATORS

- A. Manufacturers: Metraflex, Mason, Amber Booth or approved equal.
- B. Restrained Closed Spring Isolators:
 1. Spring Isolators:
 - a. For Exterior and Humid Areas: Furnish hot dipped galvanized housings and neoprene coated springs.
 - b. Code: Color code springs for load carrying capacity.
 2. Type: Closed spring mount with top and bottom housing separated with neoprene rubber stabilizers.
 3. Springs: Minimum horizontal stiffness equal to 75 percent vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection.
 4. Housings: Incorporate neoprene isolation pad meeting requirements for neoprene pad isolators, and neoprene side stabilizers with minimum 0.25 inch clearance and limit stops.
- C. Spring Hanger:
 1. Spring Isolators:
 - a. For Exterior and Humid Areas: Furnish hot dipped galvanized housings and neoprene coated springs.
 - b. Code: Color code springs for load carrying capacity.
 2. Springs: Minimum horizontal stiffness equal to 75 percent vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection.
 3. Housings: Incorporate [neoprene isolation pad meeting requirements for neoprene pad isolators] [rubber hanger with threaded insert].
 4. Misalignment: Capable of 20 degree hanger rod misalignment.
- D. Neoprene Pad Isolators:
 1. Rubber or neoprene-waffle pads.
 - a. 30 durometer.
 - b. Minimum 1/2 inch thick.
 - c. Maximum loading 40 psi.
 - d. Height of ribs: not to exceed 0.7 times width.
- E. Rubber Mount or Hanger: Molded rubber designed for 0.5 inches deflection with threaded insert.
- F. Glass Fiber Pads: Neoprene jacketed pre-compressed molded glass fiber.
- G. Seismic Snubbers:
 1. Type: Non-directional and double acting unit consisting of interlocking steel members restrained by neoprene elements.
 2. Neoprene Elements: Replaceable, minimum of 0.75 inch thick.
 3. Capacity: 4 times load assigned to mount groupings at 0.4 inch deflection.
 4. Attachment Points and Fasteners: Capable of withstanding 3 times rated load capacity of seismic snubber.

2.21 SPRING ISOLATION ROOF CURB (SEISMIC)

- A. Manufacturers: Mason Type SRSC, Amber Booth, Vibro-Acoustics or approved.
- B. Spring isolation type with rectangular steel tube lower member, continuous upper frame within "captive: guides to resist wind and seismic forces, adjustable and removable rust-resistant steel springs mounted on 1/4" neoprene pads and having minimum deflection of 2", plated or galvanized hardware, flexible aluminum seal weatherproofing and 2" insulation on lower curb.
- C. Curb shall be built to seismically contain the rooftop unit.

2.22 TAGS

- A. Plastic Tags: Laminated three-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 1-1/2 inches high.
- B. Metal Tags: Brass, Aluminum or Stainless Steel with stamped letters; tag size minimum 1-1/2 inches diameter with finished edges. Plain English designations.
- C. Information Tags: Clear plastic with printed "Danger," "Caution," or "Warning" and message; size 3-1/4 x 5-5/8 inches with grommet and self-locking nylon ties.
- D. Tag Chart: Plain English designations so no tag or valve chart is required.

2.23 PIPE MARKERS

- A. Color and Lettering: Conform to ASME A13.1. Specific examples are noted in the table below.

Service	Background Color	Letter Color	Legend
Refrigerant	Purple	White	R-{TYPE} REFRIGERANT (EXAMPLE: R-410A REFRIGERANT)
Condensate	Black	White	CONDENSATE

- B. Plastic Pipe Markers: Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering. Larger sizes may have maximum sheet size with spring fastener.
- C. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.

2.24 CEILING TACKS

- A. Description: Steel with 3/4 inch diameter color-coded head.
- B. Color code as follows:
 1. HVAC equipment: Yellow.
 2. Fire dampers/smoke dampers: Red.
 3. Heating/cooling valves: Blue.

2.25 LOCKOUT DEVICES

- A. Lockout Hasps: Anodized aluminum hasp with erasable label surface; size minimum 7-1/4 x 3 inches.
- B. Valve Lockout Devices: Nylon device preventing access to valve operator, accepting lock shackle.

2.26 PAINT

- A. Factory Finished Equipment: See individual equipment specification.
- B. Ductwork: Paint interior of ductwork visible through grilles and diffusers with a flat black paint. Prepare and paint surfaces in accord with Division 9.

2.27 SEISMIC SUPPORTS

- A. Provide seismic support as required by IBC 1613 and local authorities.
- B. Sway bracing for ductwork, piping, and equipment shall consist of steel angles, rods or pipes. Shapes, lengths and methods of attachment shall be in accord with SMACNA "Guidelines for Seismic Restraints of Mechanical Systems".

PART 3 EXECUTION

3.1 EXISTING WORK

- A. Provide access to existing piping, ductwork, equipment and other installations remaining active and requiring access.
- B. Extend existing piping and ductwork installations using materials and methods compatible with existing installations.

3.2 SURFACE PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter affecting bond of firestopping material.
- B. Remove incompatible materials affecting bond of adhesives or firestopping.
- C. Install backing or damming materials to arrest liquid material leakage.
- D. Obtain permission from Architect/Engineer before drilling or cutting structural members.
- E. Degrease and clean surfaces to receive adhesive for identification materials.

3.3 INSTALLATION-CLEARANCE

- A. Appliances and equipment shall be accessible for inspection, service, repair and replacement.
- B. Clearance shall be provided for the replacement of filters.
- C. A minimum of 30" of clearance shall be provided in front of the control side of appliances and equipment. Provide additional space when required by NEC.

- D. All control components shall be accessible for inspection and replacement.

3.4 INSTALLATION - VALVES

- A. Install valves with stems upright or horizontal, not inverted.
- B. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.
- C. Install 3/4 inch ball valves with cap for drains at main shut-off valves, low points of piping, bases of vertical risers, and at equipment.
- D. Install valves with clearance for installation of insulation and allowing access.
- E. Provide access panels where valves and fittings are not accessible.
- F. Insulate valves according to application in Section 23 07 00.

3.5 VALVE APPLICATIONS

- A. Install ball or butterfly valves for shut-off and to isolate equipment, part of systems, or vertical risers.
- B. Install globe valves for throttling, bypass, or manual flow control services.
- C. Install spring loaded check valves on discharge of pumps.

3.6 INSTALLATION - PIPE HANGERS AND SUPPORTS

- A. Support horizontal piping as scheduled.
- B. Install hangers with minimum 1/2 inch space between finished covering and adjacent work.
- C. Place hangers within 12 inches of each horizontal elbow.
- D. Use hangers with 1-1/2 inch minimum vertical adjustment.
- E. Support vertical piping at every floor.
- F. Where piping is parallel and at same elevation, provide multiple pipe or trapeze hangers.
- G. Support riser piping independently of connected horizontal piping.
- H. Provide copper plated hangers and supports for copper piping.
- I. Design hangers for pipe movement without disengagement of supported pipe.
- J. Adjust hangers and supports as required to bring system to proper line and grade. Piping shall be plumb with floor and parallel/perpendicular to building structure.
- K. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
- L. Provide clearance in hangers and from structure and other equipment for installation of insulation. Insulated piping shall have insulation run continuous through hangers and

supports with use of rigid inserts. Insulation shall be glued to both sides of insert at hangers and supports, no insulation gaps are allowed. Refer to Section 23 07 00.

- M. Support of pipe, tubing and equipment shall be accomplished by means of engineered products, specific to each application. Makeshift, field devised methods shall not be allowed.

3.7 INSTALLATION-PIPING PROTECTION

- A. Provide protective shield plates in concealed locations where piping, other than cast-iron or steel, is installed in studs, joists or rafters. Plates shall be 16 gage steel and cover the pipe area plus 2". Shields may be omitted if piping is more than 1-1/2" from nearest edge of structural member.

3.8 INSTALLATION – DUCTWORK

- A. Locate hangers, supports and accessories to handle loads imposed by ductwork, and air distribution devices and with maximum spacing noted.
- B. Support all ductwork to prevent sag, undue play and swing.
- C. Maximum support spacing per SMACNA standards. Spacing shall not exceed 10 feet.
- D. Before concrete is placed, install embedded inserts and secure firmly to form work.
- E. Assemble and install hangers and supports on ductwork.
- F. All supports and attachments for exposed ducts shall have non-removable fasteners.
- G. Attachments to fireproofed steel structure shall be made prior to spraying of fireproofing material. If necessary to disturb fireproofing after initial spraying, provide respraying or repairs necessary to restore the integrity of the fireproofing.
- H. Adjust hangers and supports as required to bring system to proper line and grade. Ductwork shall be plumb with floor and parallel/perpendicular to building structure.

3.9 INSTALLATION – SEISMIC CONTROLS

- A. Provide seismic restraints and hangers in compliance with IBC 1613 and ASCE 7.
- B. Seismic Bracing is specifically required for but not limited to:
 - 1. All smoke control ductwork.
 - 2. All ductwork associated with life safety systems (Including stair and elevator pressurization.
 - 3. All ductwork with a cross sectional area of 6 square feet or a diameter of 34 inches or greater.
- C. Seismic Bracing: Follow IBC 1613, ASCE 7, SMACNA Seismic Restraint Manual and the following.
 - 1. Bracing shall be bidder designed to resist seismic loading in accord with Chapter 16 of the International Building Code, ASCE 7 or the SMACNA guideline.
 - 2. Provide seismic calculations as required for $I_p = 1.5$.
 - 3. Transverse bracing shall occur at a maximum interval of 30 feet, at each duct turn and at the end of a duct run.
 - 4. Longitudinal bracing shall occur at a maximum interval of 60 feet.
 - 5. Bracing may be omitted where duct hangers are less than 12 inches in length.

3.10 INSTALLATION - EQUIPMENT BASES AND SUPPORTS

- A. Provide housekeeping pads of concrete, minimum 4 inches thick and extending 6 inches beyond supported equipment.
- B. Using templates furnished with equipment, install anchor bolts, and accessories for mounting and anchoring equipment.
- C. Construct supports of formed steel channel or steel pipe and fittings. Brace and fasten with flanges bolted to structure.
- D. Provide rigid anchors for pipes after vibration isolation components are installed.

3.11 INSTALLATION - FLASHING

- A. Provide flexible flashing and metal Counterflashing where piping and ductwork penetrate weather or waterproofed walls, floors, and roofs.
- B. Provide acoustical lead flashing around ducts and pipes penetrating equipment rooms for sound control.
- C. Provide curbs for roof installations 14 inches minimum high above roofing surface. Flash and counter-flash with sheet metal; seal watertight. Attach Counterflashing to equipment and lap base flashing on roof curbs. Flatten and solder joints.
- D. Adjust storm collars tight to pipe with bolts; caulk around top edge. Use storm collars above roof jacks. Screw vertical flange section to face of curb.

3.12 INSTALLATION - SLEEVES

- A. Exterior watertight entries: Seal with mechanical sleeve seals.
- B. Set sleeves in position in forms. Provide reinforcing around sleeves.
- C. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- D. Extend sleeves through floors 1 inch above finished floor level. Caulk sleeves.
- E. Where piping or ductwork penetrates floor, ceiling, or wall, close off space between pipe or duct and adjacent work with insulation and caulk or fireproof airtight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.

3.13 INSTALLATION – ACCESS PANELS

- A. Furnish access panels for installation at all concealed equipment which requires service, maintenance or adjustment to include but not limited to equipment, dampers, control valves, filters and controls.
- B. Provide location layout and required size for all access panels to general contractor. Layout shall be regular and consistent, maintain a uniform wall panel height of 24" center line above finished floor, unless noted otherwise.
- C. Furnish fire rated access panels where installed in fire rated assembly.
- D. Provide stainless steel access panels where installed in tile surfaces.

- E. Furnish access panels to general contractor for installation
- F. Paint installed access panels to match wall or ceiling. Verify that panels are not painted shut.

3.14 INSTALLATION – FIRESTOPPING AND SEALS AT PARTITIONS

- A. Installation of Firestop shall be performed by either a specialty contractor specializing in firestop application (FM G 4991 or UL Qualified Firestop Contractor), or general or sub-contractors with experience in similar applications and projects with installers qualified, trained, and certified by the firestop manufacturer. Installation shall be performed in strict accordance with manufacturer's detailed installation procedures.
- B. Install material at fire rated construction perimeters and openings containing penetrating sleeves, piping, ductwork, and other items, requiring firestopping.
- C. Apply primer where recommended by manufacturer for type of firestopping material and substrate involved, and as required for compliance with required fire ratings.
- D. Apply firestopping material in sufficient thickness to achieve required fire and smoke rating, to uniform density and texture.
- E. Install dams when required to properly contain Fire stopping materials within openings and as required to achieve required fire resistance rating. Combustible damming material must be removed after appropriate curing. Incombustible damming materials may be left as a permanent component of the Firestop system.
- F. Place foamed material in layers to ensure homogenous density, filling cavities and spaces. Place sealant to completely seal junctions with adjacent dissimilar materials.
- G. Place intumescent coating in sufficient coats to achieve rating required.
- H. Clean adjacent surfaces of firestopping materials.
- I. Seal openings at surface as follows:
 - 1. Install sleeve through opening and extending beyond minimum of 1 inch on both sides of building element.
 - 2. Size sleeve allowing minimum of 1 inch void between sleeve and building element.
 - 3. Pack void with backing material.
 - 4. Seal ends of sleeve with UL listed fire resistive silicone compound to meet fire rating of structure penetrated.

3.15 INSTALLATION - PENETRATIONS OF NON-RATED SURFACES

- A. Seal opening through non-fire rated wall, partition, floor, ceiling, and/or roof opening as follows:
 - 1. Install sleeve through opening and extending beyond minimum of 1 inch on both sides of building element.
 - 2. Size sleeve allowing minimum of 1 inch void between sleeve and building element.
- B. Install escutcheons where piping penetrates non-fire rated surfaces in occupied spaces.
- C. Exterior wall openings below grade: Assemble rubber links of mechanical sealing device to size of piping and tighten in place, in accordance with manufacturer's instructions.

- D. Interior partitions: Seal pipe penetrations air tight. Apply sealant to both sides of penetration to completely fill annular space between sleeve and conduit.

3.16 INSTALLATION-VIBRATION ISOLATION

- A. Install isolation for motor driven equipment.
- B. Install flexible pipe connectors on pipes connected to equipment supported by vibration isolation. Provide line size flexible connectors.
- C. Install flexible connectors at right angles to displacement. Install one end immediately adjacent to isolated equipment and anchor other ends. Install in horizontal plane unless indicated otherwise.
- D. For grooved piping systems the use of three flexible couplings followed by a rigid coupling shall be considered equivalent to a flexible pipe connector.
- E. Bases:
 - 1. Set steel bases for 1 inch clearance between housekeeping pad and base.
 - 2. Set concrete inertia bases for 2 inch clearance between housekeeping pad and base.
- F. Adjust equipment level.
- G. Install spring hangers without binding.
- H. On closed spring isolators, adjust so side stabilizers are clear under normal operating conditions.
- I. Prior to making piping connections to equipment with operating weights substantially different from installed weights, block up equipment with temporary shims to final height. When full load is applied, adjust isolators to load to allow shim removal.
- J. Provide resiliently mounted equipment, piping, and ductwork with seismic snubbers. Provide each inertia base with minimum of four seismic snubbers located close to isolators. Snub equipment designated for post disaster use to 0.05 inch maximum clearance. Provide other snubbers with clearance between 0.15 inch and 0.25 inch.
- K. Support piping connections to isolated equipment resiliently to nearest flexible pipe connector or as follows:
 - 1. Up to 4 inch Diameter: First three points of support.
 - 2. 5 to 8 inch Diameter: First four points of support.
 - 3. 10 inch Diameter and Over: First six points of support.
 - 4. Select three hangers closest to vibration source for minimum 1.0 inch static deflection or static deflection of isolated equipment. Select remaining isolators for minimum 1.0 inch static deflection or 1/2 static deflection of isolated equipment.

3.17 INSTALLATION – EXPANSION FITTINGS AND LOOPS

- A. Install Work in accordance with ASME B31.9
- B. Rigidly anchor pipe to building structure. Provide pipe guides to direct movement only along axis of pipe. Erect piping so strain and weight is not on cast connections or apparatus.

- C. Provide support and anchors for controlling contraction of piping. Provide loops, pipe offsets, and swing joints, or expansion joints where required.
- D. Provide expansion loops as indicated in Drawings.

3.18 INSTALLATION - SPRING ISOLATION ROOF CURB (SEISMIC)

- A. Unit supported must be solidly fastened to the top floating rail and the lower section anchored to the roof structure. Mechanical contractor to hire third party structural engineer to provide exact number and size of bolts/fasteners and provide equipment seismic calculations.
- B. Provide acoustical materials in bottom of curb as shown on plan detail.

3.19 INSTALLATION – CONDENSATE

- A. For all cooling coils, high efficiency gas burners and other equipment requiring condensate drainage, provide appropriately sized condensate pumps where gravity drainage is not possible or where scheduled.
- B. Coordinate number and type of condensate pumps required with Plumbing Contractor.
- C. Provide condensate overflow switches on cooling coils where damage to building components could occur as a result of overflow as required by IMC.
- D. For wall mounted fan coils, condensate pump, reservoir, wiring and piping shall not be exposed to view. Field fabricated concealment is not acceptable.
- E. For pumps located in equipment cabinet, above ceiling, fascia kit or unfinished space, obtain power for condensate pump directly from electrical terminal block on unit served. Coordinate with electrical contractor.
- F. For wall mount fan coils with pumps located above a ceiling, obtain power from electrical circuit. Coordinate with electrical contractor.
- G. Connect condensate pump alarm wiring to unit served power terminals per manufacturer's installation instructions. Coordinate with electrical contractor. Unit served shall shut down when condensate reservoir is full to prevent overflow.

3.20 INSTALLATION-IDENTIFICATION

- A. Install identifying devices after completion of coverings and painting.
- B. Install plastic nameplates with corrosive-resistant mechanical fasteners, or adhesive.
- C. Install labels with sufficient adhesive for permanent adhesion and seal with clear lacquer. For unfinished canvas covering, apply paint primer before applying labels.
- D. Install tags using corrosion resistant chain. Use plain English designations so no index or chart is required.
- E. Nameplates: Identify mechanical equipment (air handling units, air terminal units, pumps, heat transfer equipment, tanks, and water treatment devices) with plastic nameplates.
 - 1. Identify in-line pumps and other small devices with name tags.
 - 2. Identify control panels and major control components outside panels with plastic nameplates.

3. Identity description should be as numbered on drawings or plain English description. i.e. "EF-1" or "Boiler Controls".
 4. Label automatic controls, instruments, and relays. Key to control schematic.
 5. Label wall controls and switches with associated equipment designation and control function, i.e. "EF-1 Switch".
- F. Valve Tags: Identify valves in main and branch piping and radiator valves with tags.
1. Do not provide numbered tags.
 2. Provide tags with plain English description of service and function. i.e. "Hot Water Supply, 2nd Floor"
- G. Pipe Labels: Identify piping, concealed or exposed, with plastic tape pipe markers.
1. Identify service, flow direction, and pressure.
 2. Install in clear view and align with axis of piping.
 3. Locate identification on straight runs including risers and drops with spacing not to exceed 20 feet.
 4. Locate adjacent to each valve and tee, at each side of penetration of structure or enclosure, and at each obstruction.
- H. Provide ceiling tacks to locate valves or dampers above T-bar type panel ceilings. Locate in corner of panel closest to equipment.
- I. Equipment and Valve Tag Index: Plain English designations so no chart or index is required.

3.21 CLEANING

- A. Contractor shall make all mechanical components free of dust and dirt prior to startup.

3.22 PROTECTION OF FINISHED WORK

- A. Protect adjacent surfaces from damage by material installation.

3.23 SCHEDULES

- A. Copper and Steel Pipe Hanger Spacing:

PIPE SIZE Inches	COPPER TUBING MAXIMUM HANGER SPACING Feet	STEEL PIPE MAXIMUM HANGER SPACING Feet	COPPER TUBING HANGER ROD DIAMETER Inches	STEEL PIPE HANGER ROD DIAMETER Inches
1/2	5	7	3/8	3/8
3/4	5	7	3/8	3/8
1	6	7	3/8	3/8
1-1/4	7	7	3/8	3/8
1-1/2	8	9	3/8	3/8
2	8	10	3/8	3/8

2-1/2 (Note 2)	9	11	1/2	1/2
3	10	12	1/2	1/2
4	12	14	1/2	5/8
5	13	16	1/2	5/8
6	14	17	5/8	3/4

B. Plastic and Ductile Iron Pipe Hanger Spacing:

PIPE MATERIAL	MAXIMUM HANGER SPACING Feet	HANGER ROD DIAMETER Inches
ABS (All sizes)	4	3/8
FRP (All Sizes)	4	3/8
Ductile Iron (Note 2)		
PVC (All Sizes)	4	3/8

C. Note 1: Refer to manufacturer's recommendations for grooved end piping systems.

D. Note 2: 20 feet maximum spacing, minimum of one hanger for each pipe section close to joint behind bell. Provide hanger at each change of direction and each branch connection. For pipe sizes 6 inches and smaller, subjected to loadings other than weight of pipe and contents, limit span to maximum spacing for water service steel pipe.

3.24 SCHEDULES

A. Pipe Isolation Schedule:

Pipe Size Inch	Isolated Distance from Equipment diameters
1	120 diameters
2	90 diameters
3	80 diameters
4	75 diameters
6	60 diameters

END OF SECTION

SECTION 23 05 93 - TESTING, ADJUSTING, AND BALANCING

PART 1 GENERAL

1.1 SCOPE

- A. Testing, adjusting and balancing of air systems.
- B. Testing, adjusting and balancing of Division 22 domestic water systems.
- C. Measurement of final operating conditions of above systems.
- D. Duct pressure (leakage) testing as required by 23 31 00.
- E. Preparation of formal report.

1.2 PERFORMANCE CRITERIA

- A. Work shall be performed by approved independent testing and balancing agency.
- B. Perform testing and balancing in accordance with Associated Air Balance Council (AABC) or National Environmental Balancing Bureau (NEBB). All work shall be supervised.
- C. Calibrate instruments used for testing and balancing within a period of six months of start of work.
- D. Mechanical contractor shall assist Balancing Agency in testing and balancing of mechanical system.

1.3 SUBMITTAL

- A. Provide three (3) copies of typed and bound report to be included in Preliminary Commissioning Report.
- B. Provide three (3) additional copies of updated and/or corrected report for Final Commissioning Report.

1.4 FORMAT

- A. Report shall consist of test sheets similar to AABC Standard Forms for Diffusers and Grilles, Air Handling Equipment, Exhaust Fans, and Pumps (i.e., Form 12666 for Diffusers and Grilles).
- B. Report shall include the following.
 - 1. Preface suggesting abnormalities and problems encountered.
 - 2. Instrumentation List including type, model, manufacturer, serial number, and calibration dates.
 - 3. System Identification reporting location of equipment, zones, supply, return, and exhaust openings.
 - 4. Record following for each piece of air handling equipment.
 - a. Manufacturer, model number, and serial number.
 - b. Design and manufacturer rated data.
 - c. Actual CFM
 - d. Suction and discharge static pressure of each fan.

- e. Outside-air and return-air total CFM.
- f. Actual operating current, voltage, and brake horsepower of each fan motor.
- g. Final RPM of each motor.
- h. Fan and motor sheave manufacturer, model, size, number of grooves and center distance.
- i. Belt size and quantity.
- j. Static-pressure controls final operating set points.

1.5 QUALIFICATIONS

- A. Work of this section shall be performed by independent Air Testing and Balance Agency specializing in testing and balancing of heating, ventilating, and cooling systems to balance, adjust, and test air moving equipment, air distribution, and exhaust systems.
- B. Agency shall provide proof of having successfully completed at least five years of specialized experience in air and hydronic system balancing. Work by this Agency shall be done under direct supervision of qualified heating and ventilating engineer employed by Agency.
- C. Agency shall be approved in writing by Architect.
- D. Neither Architect's engineering consultant nor anyone performing work on this Project under Division 23 shall be permitted to do this work.

1.6 ACCEPTABLE TEST AND BALANCE COMPANIES

- | | | |
|----|---------------------------|--------------|
| A. | AIRTEST Co., Inc. | 425-313-0172 |
| B. | Neudorfer Engineers, Inc. | 206-621-1810 |
| C. | Hardin & Sons | 253-862-6645 |

PART 2 **PRODUCTS**

Not Used.

PART 3 **EXECUTION**

3.1 EXAMINATION

- A. Verify systems are complete and in good working order before commencing work. Then, put all systems and equipment into operation and continue operation until all adjusting, balancing, testing, demonstrations, instructions and cleaning of systems have been completed. Verify the following:
 - 1. Systems are started and operating in safe and normal condition.
 - 2. Temperature control systems are installed complete and operable.
 - 3. Proper thermal overload protection is in place for electrical equipment.
 - 4. Final filters are clean and in place.
 - 5. Duct systems are clean of debris.
 - 6. Fans are rotating correctly.
 - 7. Fire and volume dampers are in place and open.
 - 8. Air coil fins are cleaned and combed.
 - 9. Access doors are closed and duct end caps are in place.

10. Air outlets are installed and connected.
11. Duct system leakage is minimized.
12. Hydronic systems are flushed, filled, and vented.
13. Pumps are rotating correctly.
14. Proper strainer baskets are clean and in place or in normal position.
15. Service and balancing valves are open.

3.2 PREPARATION

- A. If requested, conduct tests in presence of Architect.
- B. Instruments used by Agency shall be accurately calibrated and maintained in good working order.
- C. Furnish instruments required for testing, adjusting, and balancing operations including ladders, scaffolding, additional dampers and clean filters.
- D. Make instruments available to Architect/Engineer to facilitate spot checks during testing.
- E. During balancing technician's initial test of air handling systems, the Mechanical Contractor shall have his sheetmetal foreman present to assist in any drive changes or dampers necessary.

3.3 INSTALLATION TOLERANCES

- A. Diffuser, register and grille air flow rates shall be measured and adjusted to deliver final flow rates within 10% and within 50 cfm of design rates, whichever is less.
- B. Fan air flow rates shall be measured and adjusted to deliver final flow rates within 10% and within 100 cfm of design rates, whichever is less.
- C. Water flow rates shall be measured and adjusted to deliver final flow rates within 10% and within 5 gpm of design rates, whichever is less.
- D. Pump flow rates shall be measured and adjusted to deliver final flow rates within 10% and within 25 gpm of design rates, whichever is less.

3.4 ADJUSTING

- A. Ensure that clean filters, of the type specified, are installed prior to air balancing.
- B. Provide additional volume dampers as necessary to accomplish design balances.
- C. Set minimum position of motorized dampers for scheduled minimum outside air.
- D. Pumps shall be proportionally balanced to minimize throttling losses, and then the pump impeller shall be trimmed or the pump speed modified to meet design flow conditions.
- E. Check motors for proper rotation, coupling and drive alignment, belt tension and freedom from vibration, etc.
- F. Provide belt drive/sheave changes to adjust fan rpm as necessary to accomplish design balances.
- G. Verify recorded data represents actual measured or observed conditions.

- H. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.
- I. After adjustment, take measurements to verify balance has not been disrupted. If disrupted, verify correcting adjustments have been made.
- J. Report defects and deficiencies noted during performance of services, preventing system balance.
- K. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.
- L. After completion of testing and balancing, operate systems under normal conditions for at least two days of 8 hours each to demonstrate specified performance.

3.5 AIR SYSTEM PROCEDURE

- A. Perform soloing testing and balancing functions in accordance with Associates Air Balance Council National Standards.
- B. Adjust air handling and air distribution systems to obtain design supply, return, and/or exhaust air quantities.
 - 1. Test and adjust total system CFM by adjustment of fan speeds. Provide sheave drive changes as necessary.
 - 2. Perform tests at high and low speeds of variable speed systems.
 - 3. Adjust branch air quantities by damper regulation. Multi-diffuser branch ducts shall have at least one outlet or inlet volume damper completely open to minimize throttling losses.
 - 4. Make air quantity measurements in main ducts and for outside air by Pitot tube traverse of entire cross sectional area of duct.
 - 5. Measure air quantities at air inlets and outlets.
- C. Diffusers, Registers and Grilles:
 - 1. Adjust air distribution to obtain uniform space temperatures free from objectionable drafts.
 - 2. Use volume control devices to regulate air quantities only to the extent that the adjustments do not create objectionable air motion or sound levels.
 - 3. Effect volume control by using volume dampers located in ducts.
- D. Provide system schematic:
 - 1. Identify the location and area of each grille, diffuser, register, and terminal box.
 - 2. Record the required and actual air quantities at each outlet or inlet.
 - 3. Record size, type, and manufacturer of each diffuser, grille, and register on air outlet data sheets.
- E. Air Temperature:
 - 1. Measure wet and dry bulb air temperatures on entering and leaving side of each cooling coil and unit in cooling mode.
 - 2. Measure dry bulb temperatures on entering and leaving side of each heating coil and unit in heating mode.
- F. Pressure:
 - 1. Measure static pressure conditions on air units, including filter and coil pressure drops, and total pressure across fan with suction and discharge pressures.
 - 2. Make air balancing allowances for 50 percent loading of filters.

3. Measure building static pressure.
- G. Electrical:
 1. Record nameplate motor current and voltage.
 2. Measure actual motor current and voltage at balanced condition.
- H. Dampers:
 1. Adjust outside air, return air, and exhaust dampers for design conditions.
 2. At modulating damper locations, take measurements and balance at extreme conditions.
- I. Permanently mark all outside air, supply air, and return air damper positions after balancing has been completed.
- J. Smoke testing, or some other approved means, may be required to determine leak locations if air balance report indicated that any system's CFM total is less than 10 percent of design CFM. Prior to test, verify that system's duct joints have been sealed as specified and that air moving device in question is supplying required design system air flow. Architect will approve test method required. If smoke test is selected, use following procedure. Provide necessary precautions to protect those performing or observing test from being exposed to smoke.
 1. Use zinc chloride smoke candles, titanium tetrachloride ampules or sticks, or other devices acceptable to Architect to generate smoke.
 2. Close openings in duct except for one opening at farthest end of duct run.
 3. If re-balancing is required, submit revised air test and balance reports to Architect before Substantial Completion.
 4. Spot balance and rebalance shall be performed at no additional cost to Owner.

3.6 PLUMBING PROCEDURE

- A. Domestic pump circulators:
 1. Test total system GPM and head.
 2. Adjust branch flows by circuit setters for equal flow distribution.
- B. Pressure boosting pumps:
 1. Test total system GPM and head.
- C. Sewage\Sump pumps:
 1. Test float activation and controls.

3.7 TYPE I KITCHEN HOOD SYSTEM

- A. Test and balance hood exhaust system to be equal to or greater than scheduled value. Under balance is not acceptable.
- B. Test and balance make-up air system to be at least 90% of exhaust air quantity.

3.8 FINAL INSPECTION AND ADJUSTMENTS

- A. System shall be balanced and reports submitted before substantial completion inspection.
- B. Balancing Agency shall be represented at inspection meeting(s) by qualified testing personnel with balancing equipment and two copies of current air balancing test report.

1. Architect will choose and direct spot balancing. Differences greater than specified tolerance between the spot balance and test report will be justification for requiring repeat of testing and balancing for entire building and submission of a new test report. In such case a new inspection will be made.
 2. Perform rebalancing in presence of Architect/Engineer and subject to their approval.
 3. If re-balancing is required, submit revised air test and balance reports to Architect before Substantial Completion.
 4. Spot balance and rebalance shall be performed at no additional cost to Owner.
- C. Where systems provides over 5 percent more air than schedule requirements, rooms supplied by that system shall have their supply air quantities increased by ratio of actual total air quantity supplied to minimum air quantity required by system schedule.

3.9 SUPPLEMENTAL WARRANTY

- A. Test and balance agency shall include an extended warranty of 90 days, after occupancy, during which the Owner's representative, at his discretion, may request a recheck or resetting of any outlet, supply air or exhaust fan, as listed in test report.

END OF SECTION

SECTION 23 07 00 - HVAC INSULATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Piping system insulation.
 - 2. Equipment insulation.
 - 3. Pipe insulation jackets.
 - 4. Equipment insulation jackets.
 - 5. Insulation accessories including vapor retarders and accessories.
 - 6. Ductwork insulation.
 - 7. Ductwork insulation jackets.
 - 8. Duct liner.

1.2 QUALITY ASSURANCE

- A. Insulation must have maximum flame spread index of 25 and maximum smoke developed index of not exceeding 50 in accordance with ASTM E84.
- B. All systems components subject to heat loss or gain, such as, piping, storage tanks, vessels, valves etc. shall be insulated to conform with the Washington State Energy Code (as minimum) and this section.

1.3 IDENTIFICATION

- A. Insulation shall bear a manufacturer's mark indicating the product R-value, or K-value and thickness. This mark shall be visible after installation and shall be repeated at an interval of no greater than 10 feet.
- B. External duct insulation shall be legibly printed or identified at intervals not greater than 36 inches with name of manufacturer, R-value, thickness, flame spread and smoke-developed index.
- C. R-values shall be based on insulation at 75 F mean temperature difference.
- D. For rigid or spray foam the aged R-value per inch shall be provided in submittals.

1.4 REQUIREMENTS

- A. Where multiple products are listed for the same application, select a single product to provide throughout.
- B. For round and flat oval ductwork use only liner specific for round application. Using flat liner is not acceptable.

PART 2 PRODUCTS

2.1 GLASS FIBER, BLANKET

- A. Manufacturers: Johns Manville Micro-Flex or equal by Owens-Corning, Knauf, Manson or approved equal.

- B. Insulation: Semi-rigid, shot-free, continuous fiber, noncombustible. ASTM C1393.
 - 1. 'K' factor: 0.24 at 75 degrees F.
 - 2. Maximum Service Temperature: 850 degrees F.
 - 3. Maximum Moisture Absorption: 0.2 percent by volume.
 - 4. Density: 2.5 lb/cu ft.
- C. Vapor Retarder Jacket: reinforced facing, will accept paint. Seal with pressure sensitive tape.

2.2 POLYOLEFIN INSULATION

- A. Manufacturers: IMCOA or similar.
- B. Polyolefin or Polyethylene pipe insulation is **NOT ACCEPTABLE** for any application.

2.3 ELASTOMERIC CELLULAR FOAM (PIPE)

- A. Manufacturers: Armacell AP/Armaflex, Aeroflex Aerocel or approved equal.
- B. Preformed flexible, closed-cell, elastomeric thermal insulation: Type I, Tubular form, self-seal or continuous, 25/50-rated, CFC free, low VOC, 'K' factor: 0.27 at 75 degrees F. ASTM C534.
- C. Rigid clamp/hanger insert: Armacell Armafix, polyurethane insert and aluminum jacket, single piece with self-adhering closure.

2.4 FLEXIBLE GLASS FIBER DUCT LINER (SOUND LINER)

- A. Manufacturers: Johns Manville Linacoustic RC or equal by Knauf, Manson or approved equal.
- B. Description: Flexible duct liner, glass fiber bonded with thermosetting resin, airstream surface protected with reinforced coating.
 - 1. ASTM E84, UL 723
 - 2. Installed R Value: 1" R-4.2, 2" R-8.0
 - 3. Maximum service temperature: 250 degrees F.
 - 4. Maximum Velocity on Coated Air Side: 6,000 fpm.
 - 5. Acrylic polymer coating to prevent dust incursion and biological growth.
- C. Liner Fasteners: Galvanized steel, impact applied or welded with integral head.
- D. Field coat edges with Superseal edge treatment.

2.5 GLASS FIBER DUCT WRAP

- A. Manufacturers: Johns Manville Microlite XG 75 or equal by Owens-Corning, Knauf, Manson or approved equal.
- B. Description: Formaldehyde-free, flame-attenuated glass fibers bonded with thermosetting acrylic resin, FSK facing.
 - 1. ASTM E84, UL 723
 - 2. Installed R Value: 1-1/2" R-4.2, 2" R-5.6, 2.5" R-6, 3" R-8.3, 4.5" R-12, 5.75" R-16.
 - 3. Maximum Service Temperature: 250 degrees F.
 - 4. Density: 0.75 lb/cu ft

- C. Vapor Retarder Jacket: Reinforced FSK facing. Seal with pressure sensitive 2" tape.
- D. Identification: At intervals not greater than 36" print the name of manufacturer, the thermal resistance R-value at insulation thickness, the flame spread and smoke developed indexes.

2.6 FIRE RATED DUCT WRAP

- A. Manufacturers: Unifrax Fyrewrap MAX 2.0 or equal by 3M Fire Barrier, Morgan Pyroscat or approved equal
- B. High-temperature insulation blanket system specifically designed for two-hour rated commercial kitchen grease ducts which complies with ICC ES Acceptance Criteria and ASTM E-2336.
- C. Insulation: 2" thick high-temperature insulation shall be noncombustible made from calcia, magnesia and silica chemical bonded, 8 pcf. Insulation blanket shall be completely encapsulated in aluminum FSK.
- D. Installation: Two-layer system applied directly to the duct surface for zero clearance to combustibles. The first layer shall be installed with minimum 3" seam overlaps. Second layer joints shall be offset from the first and have minimum 3" seam overlaps. Seal joints of both layers with aluminum foil tape.

2.7 PIPE INSULATION AND EQUIPMENT JACKETS

- A. PVC Plastic Pipe Jacket:
 - 1. Product Description: One piece molded type fitting covers and sheet material, white color. ASTM D1784.
 - 2. Thickness: 15 mil indoor, 30 mil outdoor.
 - 3. Connections: Brush on welding adhesive.
- B. Canvas Equipment Jacket:
 - 1. Fabric: 6 oz/sq yd, plain weave cotton.
 - 2. Composite of insulation, jacket and laces.
- C. Aluminum Pipe Jacket:
 - 1. Thickness: 0.016 inch thick sheet. ASTM B209.
 - 2. Finish: Embossed
 - 3. Joining: Longitudinal slip joints and 2 inch laps.
 - 4. Fittings: 0.016 inch thick die shaped fitting covers with factory attached protective liner.
 - 5. Metal Jacket Bands: 3/8 inch wide; 0.015 inch thick aluminum.

2.8 DUCT LAGGING

- A. Manufacturers: Sound Seal B-10 LAG/QFA-9 or approved equal.
- B. Description: Loaded vinyl noise barrier with FSK facing and quilted fiberglass decoupler.
 - 1. STC: 30
 - 2. Thickness: 2"
 - 3. Density: 0.4 lb/sq ft.

PART 3 **EXECUTION**

3.1 EXAMINATION

- A. Verify piping and equipment has been tested before applying insulation materials.
- B. Verify surfaces are clean and dry, with foreign material removed.

3.2 INSTALLATION

- A. Apply insulation when building is thoroughly dry to prevent shrinkage.
- B. Exposed Piping: Locate insulation and cover seams in least visible locations.
- C. Insulate entire piping system including fittings, valves, unions, flanges, strainers, flexible connections, pump fittings, connections to equipment and expansion joints. Use canvas jackets for valves and other irregular shapes.
- D. Insulate flanges and unions with removable sections and jackets.
- E. Piping Inserts and Shields:
 - 1. Insulation shall be continuous through supports and hangers with incompressible inserts and shields. Do not directly clamp/support pipe scheduled to be insulated.
 - 2. Shields: Galvanized steel saddle between pipe clevis hangers or pipe rollers and insulation. Minimum 6 inches long, of contour matching adjoining insulation; may be factory fabricated.
 - 3. Inserts: Between pipe clamps, hangers or rollers and piping.
 - 4. Insert material: Compression resistant insulating material suitable for insulation type and planned temperature range and service.
 - 5. Glue insulation to both sides of insert.
 - 6. Shields without inserts may be used at clevis hangers on refrigerant piping 5/8" and smaller with continuous insulation.
- F. Continue insulation through penetrations of building assemblies or portions of assemblies having fire resistance rating of one hour or less. Provide intumescent firestopping when continuing insulation through assembly. Finish at supports, protrusions, and interruptions.
- G. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces: Finish with PVC jacket and fitting covers.
- H. Exterior Piping Applications: Use only elastomeric closed-cell foam insulation. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with sealant. Cover with aluminum jacket with seams located at 3 or 9 o'clock position on side of horizontal piping with overlap facing down to shed water or on bottom side of horizontal equipment.
- I. Exposed Equipment: Locate insulation and cover seams in least visible locations.
- J. Apply insulation close to equipment by grooving, scoring, and beveling insulation. Fasten insulation to equipment with studs, pins, clips, adhesive, wires, or bands.
- K. Fill joints, cracks, seams, and depressions with bedding compound to form smooth surface. On cold equipment, use vapor retarder cement.
- L. Finish insulation at supports, protrusions, and interruptions.

- M. Nameplates and ASME Stamps: Bevel and seal insulation around; do not insulate over.
- N. Equipment Requiring Access for Maintenance, Repair, or Cleaning: Install insulation/lagging with removable sections for easy removal and replacement without damage. Label removable sections indicating access type, i.e. "Filter Access".
- O. Insulate exhaust air ductwork where it is outside the insulated building envelope to prevent condensation.
- P. For all insulated ductwork:
 - 1. Provide insulation with vapor retarder jackets.
 - 2. Finish with tape and vapor retarder jacket.
 - 3. Continue insulation through walls, sleeves, hangers, and other duct penetrations.
 - 4. Insulate entire system including fittings, joints, flanges, fire dampers, flexible connections, and expansion joints.
- Q. Ductwork Exposed in Mechanical Equipment Rooms or Unfinished Spaces: Finish with canvas jacket over duct insulation, sized for finish painting.
- R. Exterior Ductwork and Equipment: Provide liner. Do not provide exterior insulation on ductwork or equipment.
- S. Duct and Plenum Liner Application:
 - 1. Adhere insulation with adhesive for 100 percent coverage.
 - 2. Secure insulation with mechanical liner fasteners. Comply with SMACNA Standards for spacing.
 - 3. Seal and smooth joints. Seal and coat transverse joints.
 - 4. Seal liner surface penetrations with adhesive.
 - 5. Duct dimensions indicated are net inside dimensions required for airflow. Increase duct size to allow for insulation thickness.

3.3 SCHEDULES

- A. Piping: Provide on piping as listed below.

Service	Insulation Type	PIPE SIZE			
		<1"	1" to <1-1/2"	1-1/2 to < 4"	4" to < 8"
Refrigerant Suction(1)	Elastomeric Cellular FOAM	1"	1"	1-1/2"	-
Refrigerant Hot Gas	Elastomeric Cellular FOAM	1"	1"	1-1/2"	-

- 1. Note: Insulate Refrigerant Liquid lines same as Suction lines on all heat pump equipment, where noted by manufacturer or called for on plans.
 - 2. For all exterior piping applications use only Elastomeric Cellular Foam with Aluminum jacket.
 - 3. For all below grade piping application use only insulation specifically engineered for application. (Closed Cell Polyurethane System)
- B. Ductwork: Provide on ductwork as listed below. Insulation thickness is provided as reference; each application must meet minimum installed R-Value.

Service	Location	Insulation Type	Approx. Thickness	Min. Installed R-Value	Jacket
Supply, Return	Building Exterior (Zone 4C)	Duct Liner	3"	R-8	-
Exhaust (ERV)	Building Exterior (Zone 4C)	Duct Liner	3"	R-8	-
Supply, Return	Attic, crawlspace, parking garage or uninsulated area within building. (Zone 4C)	Duct Wrap	3"	R-8	FSK
Supply, Return, Exhaust	Unconditioned space inside building envelope.	Duct Wrap	2.5"	R-6	FSK
Supply	Concealed Space (3)	Duct Wrap	1-1/2"	R-3.3	FSK
Supply	Exposed in Space With Supply Air Temp Between 56-104F	None, Except Duct Liner shown on Plans.			
Outside Air (5)	Within Building downstream of damper. <2800 cfm	Duct Wrap / Duct Liner	3"	R-8	FSK
Outside Air (5)	Within Building downstream of damper. >=2800 cfm (Zone 4C)	Duct Wrap / Duct Liner	3"	R-8	FSK
Outside Air (5)	Within Building Between damper & building exterior. >=2800 cfm	Duct Wrap / Duct Liner	5.75"	R-16	FSK
Outside Air (ERV supply)	Between ERV & building spaces	Duct Wrap / Duct Liner	1-1/2"	R-3.3	FSK
Exhaust Air	Attic, crawlspace, parking garage or uninsulated area within building.	Duct Wrap	2.5"	R-6	FSK
Relief / Exhaust Air	Between damper & building exterior. >=2800 cfm	Duct Wrap	5.75"	R-16	FSK
Exhaust Air (ERV)	Indoor between ERV & building exterior. (Zone 4C)	Duct Wrap	3"	R-8	FSK
Exhaust Air (ERV)	Indoor between ERV & building exterior. (Zone 5B)	Duct Wrap	4.5"	R-12	FSK

1. Secure duct wrap with mechanical fasteners spaced 12" on center, minimum. For horizontal ducts 24" or more in width, duct wrap shall also be secured with mechanical fasteners spaced 18" on center, on centerline of bottom of duct.
2. External insulation is not required on internally sound lined ductwork with sufficient insulating value. For internally insulated ductwork, the required insulation thickness supersedes sound lining requirements.

3. Concealed space: Any space within the insulated building envelope that is concealed from view, i.e. behind ceiling, wall, shaft, soffit, etc.
4. For exposed ductwork in finished spaces which is required to be insulated provide internal liner with equivalent R-value.
5. In addition to the insulation requirements, outside air ductwork shall meet all air leakage and building envelope insulation requirements of the WSEC C402 and building envelope vapor control requirements from the IBC.

END OF SECTION

SECTION 23 08 00 - PROJECT COMMISSIONING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Project commissioning description.
 2. Project commissioning responsibilities.
 3. Project commissioning documentation.
 4. Commissioning Compliance Checklist

1.2 GENERAL

- A. The goal of the commissioning process is to verify the proper operation, functionality and control of building systems and equipment. The by-product of this process is the commissioning plan and report which provides a confirmation record of procedures used and results obtained. The effort and goal is focused on having all systems operating efficiently and correctly.
- B. The mechanical contractor shall retain a Commissioning Agent (CA) and commissioning services from one of the following companies or approved equal.
- | | | |
|----|---------------------------|--------------|
| 1. | AIRTEST Co., Inc. | 425-313-0172 |
| 2. | Neudorfer Engineers, Inc. | 206-621-1810 |
- C. The mechanical contractor is responsible for the commissioning process with required documentation and shall furnish labor and material directly or through the Commissioning Agent to accomplish building commissioning as specified herein.
- D. The mechanical contractor is responsible to correct deficiencies discovered during the commissioning process.

1.3 COMMISSIONING DESCRIPTION

- A. The purpose of the commissioning process is to provide Owner assurance that the systems have been installed in the prescribed manner and will operate within the performance guidelines. Commissioning is intended to enhance the quality of system start-up and aid in the orderly transfer of systems to beneficial use by the Owner.
- B. Commissioning includes complete and thorough investigations of mechanical systems to ensure proper installation and operation of all components and systems. It consists of but is not limited to the following elements:
1. The Commissioning Plan
 2. Testing and startup of HVAC equipment and systems.
 3. Testing and startup of any appropriate plumbing systems, such as water heating plants, circulation pumps and sewage ejectors.
 4. Equipment control and system verification checks.
 5. Air balancing.
 6. Plumbing balancing, including hot water recirculation.
 7. Functional performance testing.
 8. Sequence of operations testing.
 9. Completion of record drawings.
 10. Owner training.
 11. Operation & Maintenance materials.
 12. Preliminary Commissioning Report with deficiencies noted.

13. Final Commissioning Report with corrective actions taken.

1.4 COMMISSIONING AGENT

- A. The Commissioning Agent (CA) is the person who manages the commissioning process, prepares the Commissioning Plan, schedules and coordinates commissioning activities in execution of the Commissioning Plan and compiles the Commissioning Report.
- B. The CA may directly perform commissioning functions and documentation or may observe tasks assigned to others.
- C. The CA provides the Owner an unbiased, objective view of the system's installation, documentation, operation, and performance.
- D. The CA will observe the Commissioning procedures and results performed by the Contractor. The Contractor is expected to verify the functional readiness of systems to be tested prior to performing the tests in the presence of the Commissioning Agent.

1.5 COMMISSIONING SUBMITTALS

- A. See 23 00 00.
- B. Commissioning Plan: Submit copies with mechanical submittals.
 - 1. Narrative description of activities.
 - 2. Start-up test procedure and checklists
 - 3. Functional performance test checklists.
 - 4. Commissioning schedule
- C. Preliminary Commissioning Report: Submit three (3) copies at substantial completion.
 - 1. Complete start-up checklists
 - 2. Complete functional test reports
 - 3. Test & Balance report
 - 4. Deficiency report
 - 5. Commissioning Compliance Checklist
- D. Final Commissioning Report: Submit three (3) copies at project close out.
 - 1. Preliminary Commissioning Report contents
 - 2. Record drawings
 - 3. Owner training report
 - 4. Deficiency & corrective action report
 - 5. O&M manuals
- E. Complete the Commissioning Compliance Checklist and submit with the Preliminary Commissioning Report for Owner Representative review and signature. Signed checklist is required for final mechanical inspection and building certificate of occupancy. A copy of the signed checklist shall be provided to the building official.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with NEBB or AABC.
- B. Perform Work in accordance with ASHRAE Guideline 1.
- C. Perform Work in accordance with Commercial Energy Code Section C408.

1.7 COMMISSIONING MEETINGS

- A. The CA shall schedule a preliminary commissioning meeting to review the commissioning plan and schedule approximately two weeks prior to the start of commissioning work. The General Contractor, Mechanical Contractor, Electrical Contractor and Electrical Commissioning Agent, applicable sub-contractors and the Engineer shall be invited.
- B. The CA shall schedule additional commissioning meetings as necessary for coordination or information with the required participants.
- C. The General Contractor, Mechanical Contractor and Mechanical Sub-Contractors are required to attend commissioning meetings when requested by the CA or Engineer.

1.8 SCHEDULING

- A. The CA shall prepare a schedule indicating anticipated start dates for the following:
 - 1. Piping systems pressure testing (domestic, gas, refrigerant).
 - 2. Piping system flushing and cleaning.
 - 3. Ductwork cleaning.
 - 4. Ductwork pressure testing.
 - 5. Grease exhaust duct light leakage testing.
 - 6. Type I hood smoke capture performance test.
 - 7. Equipment and system startups.
 - 8. Automatic temperature control system checkout.
 - 9. Testing, adjusting, and balancing.
 - 10. Functional performance tests
 - 11. System orientation and training.
 - 12. Operation and maintenance manual submittals.
- B. Schedule seasonal tests of equipment and systems during peak weather conditions (actual or simulated) to observe full-load performance.
- C. Schedule occupancy sensitive tests during conditions of both minimum and maximum occupancy use.
- D. Schedule such that the Preliminary Commissioning Report can be submitted to the Owner for review with written acceptance obtained prior to the final mechanical inspection and the building certificate of occupancy.
- E. Within 90 days of receipt of the building certificate of occupancy, the Record Drawings, O&M Manuals, Final Balancing Report, Final Commissioning Report and documentation of completed Owner Training shall be submitted for review.

1.9 COORDINATION

- A. The mechanical contractor shall verify the commissioning schedule and notify the Commissioning Agent a minimum of two weeks in advance of the following:
 - 1. Scheduled equipment and system startups.
 - 2. Scheduled automatic temperature control system checkout.
 - 3. Scheduled start of testing, adjusting, and balancing work.
 - 4. Commissioning schedule changes.
- B. Coordinate programming of automatic temperature control system with construction and commissioning schedules.
- C. Coordinate commissioning of this section with Electrical commissioning.

- D. Provide overall coordination and management of the commissioning program as specified herein. The commissioning process will require cooperation of the Contractor, subcontractors, vendors, Architect, Commissioning Agent, and Owner. The commissioning team shall be comprised of the following:
1. Contractor
 2. Project Manager
 3. Test & Balance Engineer
 4. Subcontractors
 5. Commissioning Agent
 6. Project Engineers
 7. Owner Representative(s)
 8. Architect
 9. Mechanical Consultant
 10. Electrical Consultant

PART 2 DOCUMENTATION

2.1 COMMISSIONING PLAN

- A. The Commissioning Plan shall be prepared and executed by the Commissioning Agent and at a minimum contain the following.
- B. The Commissioning Plan shall be in a hard-backed loose-leaf binder with typewritten or printed index and tabbed dividers between principal categories.
1. Spine: Name of Project
 2. Cover: Name of Project, Owner, Location & Commissioning Agent
 3. Project Directory: Owner, Architect, Engineer, Commissioning Agent, General Contractor, Mechanical Contractor(s), Plumbing Contractor, Electrical Contractor, Test & Balance Contractor, Controls Contractor.
 4. Responsible Party: Include responsible party for each contractor.
- C. Narrative:
1. Describe building size, type of use and occupancy.
 2. Provide an overview of the building equipment, systems, controls and their functionality.
 3. Describe the activities involved in each phase of the commissioning process, including the personnel intended to accomplish each task.
- D. Roles and Responsibilities:
1. Define the tasks necessary to complete the commissioning process and assign responsibility for each to a member of the commissioning team.
- E. Commissioning Schedule:
1. Provide timeline of commissioning process tasks and information submittals with milestones for general scopes of work.
 2. Include task for sub-contractors, contractors, vendors and CA.
 3. Include owner training schedule.
- F. Start-up Test Procedure and Checklists:
1. Include a list of all equipment and systems to be tested.
 2. Intent: To test individual equipment for standalone function and operation.
 3. Use manufacturer's startup checklist when available.
 4. Utilize vendor startup and checklists for specific equipment when available.

- G. Functional Performance Test checklists:
 - 1. Intent: To test system performance and operation including controls, relays and sequences.
 - 2. Include tests for all functions noted in Sequence of Operations.
 - 3. Indicate conditions under which the test needs to be performed.
 - 4. Indicate the measured criteria required to meet the performance.
 - 5. Include space on forms to note deficiencies.

2.2 FUNCTIONAL PERFORMANCE TESTING

- A. Demonstrate the correct installation and operation of each component, system, and system-to-system intertie relationship. Control systems shall be tested to ensure that control devices, components, equipment and systems are calibrated, adjusted and operate in accordance with the sequence of operation.
- B. Test all system modes and all functions describe in the Sequence of Operations.
- C. Test systems under full-load, part-load (if applicable) and emergency conditions (if applicable).
- D. Test any redundant or automatic back-up mode.
- E. Test performance of all alarms and safeties.
- F. Test mode of operation upon loss of power and power restoration.
- G. Service Water Heating Systems:
 - 1. Perform testing under a minimum of 50% service load.
 - 2. Verify function and setpoint of mixing valves.
- H. Independently test all similar systems. Sampling reference systems is not acceptable.
- I. Physically verify by visual inspection or calibrated meter reading the operation being tested. Control system displays shall not be used as proof of function.

2.3 PRELIMINARY COMMISSIONING REPORT

- A. The Preliminary Commissioning Report shall be assembled and produced by the Commissioning Agent with information obtained from the Mechanical Contractor, Controls Contractor and Test & Balance Contractor. The report shall contain the following.
- B. The Commissioning Report shall be in hard-backed loose-leaf binder(s) with typewritten or printed index and tabbed dividers between principal categories.
 - 1. Spine: Name of Project
 - 2. Cover: Name of Project, Owner, Location & Commissioning Agent
 - 3. Project Directory: Owner, Architect, Engineer, Commissioning Agent, General Contractor, Mechanical Contractor(s), Test & Balance Contractor, Controls Contractor.
- C. System Description: Describe building systems and their intended function(s). Include equipment associated with each system.
- D. Test & Balance Report: See 23 05 93
- E. Start-up Test Checklists: Include completed start-up checklists.

- F. Functional Performance Test Checklists:
 - 1. Include completed functional performance checklists.
 - 2. Include sequence of operations checklists.
 - 3. Record conditions under which the tests were performed.
 - 4. Record the measured criteria.
- G. Deferred tests: Indicate any tests not performed due to climatic conditions with anticipated date of completion.
- H. Deficiency Report: Compile any deficiencies noted on start-up or functional performance tests on to a single report.
- I. Owner Training: Include documentation of owner operating and maintenance instruction completed to date. See section 23 00 00.
- J. Commissioning Compliance Checklist: This checklist included at the end of this section shall be completed and included for Owner review and signature.

2.4 FINAL COMMISSIONING REPORT

- A. The Final Commissioning Report shall be assembled and produced by the Commissioning Agent with information obtained from the Mechanical Contractor, Controls Contractor and Test & Balance Contractor. The Final Commissioning Report shall contain all the information provided in the Preliminary Commissioning Report and the following.
- B. The Commissioning Report shall be in hard-backed loose-leaf binder(s) with typewritten or printed index and tabbed dividers between principal categories.
 - 1. Spine: Name of Project
 - 2. Cover: Name of Project, Owner, Location & Commissioning Agent
 - 3. Project Directory: Owner, Architect, Engineer, Commissioning Agent, General Contractor, Mechanical Contractor(s), Test & Balance Contractor, Controls Contractor.
- C. Test & Balance Report: Provide updated and/or corrected report if required.
- D. Deficiency and Corrective Action Report: Include the deficiency report from the Preliminary Commissioning Report with the corrective action taken noted for each entry.
- E. Owner Training: Include documentation of completed owner operating and maintenance instruction. See section 23 00 00.
- F. Record Drawings: Include contractor's record drawings in each copy of the commissioning report. See section 23 00 00.
- G. Operating and Maintenance Manuals: Include contractor's O&M manuals with each copy of the commissioning report. (Separate binders are OK) See section 23 00 00.

PART 3 **EXECUTION**

3.1 GENERAL

- A. Contractor shall provide an individual to accompany the Commissioning Agent to assist, operate and/or make adjustments as necessary.

- B. Contractor shall provide ladders, scaffolding, additional dampers and clean filters as required.
- C. Contractor shall put all systems and equipment into operation and shall continue operation until all adjusting, balancing, testing, demonstrations, and instructions have been completed.
- D. Commissioning shall not begin until systems are completed, in good working order and have been cleaned.
- E. Check motors for proper rotation, coupling and drive alignment, belt tension and freedom from vibration, etc.

3.2 INSTALLATION

- A. Contractor shall provide additional balancing dampers, balancing valves, access doors, test ports, and pressure and temperature taps required by Commissioning Agent or to address Commissioning deficiency.
- B. Contractor shall provide replacement sheaves and belts to obtain system performance.
- C. Contractor shall install test holes in ductwork and plenums as requested by Commissioning Agent for taking air measurements. Seal test holes after measurements.
- D. Prior to start of functional performance testing, Contractor shall install clean filters in equipment.

3.3 SPECIFIC REQUIREMENTS

- A. CA shall perform or observe and document result of grease exhaust duct light leakage testing per IMC \ SMC 506.3.2.5.
- B. CA shall perform or observe and document result of Type I hood smoke capture performance test per IMC \ SMC 507.16.1.

3.4 DEFICIENCIES

- A. The Commissioning Agent shall report all observed system deficiencies to the Architect and General Contractor and shall include them in the Preliminary Commissioning Report.
- B. The Contractor shall rectify all deficiencies, detail the corrective action(s) taken on each item, initial each item of the report as "corrected" and return the deficiency report.
- C. Upon receipt of the return report, the Commissioning Agent will visit the site and inspect the corrected deficiencies. The Commissioning Agent will also initial the items of the report as "checked" and include them in the Final Commissioning Report.
- D. Further site visits by the Commissioning Agent to check deficiencies not corrected in back check, will be at the Contractor's expense.

END OF SECTION

COMMISSIONING COMPLIANCE CHECKLIST

Project Information	Project Name:
	Project Address:
	Commissioning Authority:
Commissioning Plan (Section C408.1.1)	<input type="checkbox"/> Commissioning Plan was used during construction and included items below <ul style="list-style-type: none"> • A narrative description of activities and the personnel intended to accomplish each one • Measurable criteria for performance • Functions to be tested
Systems Balancing (Section C408.2.2)	<input type="checkbox"/> Systems Balancing has been completed <ul style="list-style-type: none"> • Air and Hydronic systems are proportionately balanced in a manner to first minimize throttling losses • Test ports are provided on each pump for measuring pressure across the pump.
Functional Testing (Sections C208.2.3, C408.3.1, C408.4.1.3 and C408.5.1)	<input type="checkbox"/> HVAC Equipment Functional Testing has been completed (Section C408.2.3.1) HVAC equipment has been tested to demonstrate the installation and operation of components, systems and system-to-system interfacing relationships in accordance with approved plans and specifications <input type="checkbox"/> HVAC Controls Functional Testing has been completed (Section C408.2.3.2) HVAC controls have been tested to ensure that control devices are calibrated, adjusted and operate properly. Sequences of operation have been functionally tested to ensure they operate in accordance with approved plans and specifications <input type="checkbox"/> Economizer Functional Testing has been completed (Section C408.2.3.3) Economizers operate in accordance with manufacturer’s specifications <input type="checkbox"/> Lighting Controls Functional Testing has been completed (Section C408.3.1) Lighting controls have been tested to ensure that control devices, components, equipment, and systems are calibrated, adjusted and operate in accordance with approved plans and specifications <input type="checkbox"/> Service Water Heating System Functional Testing has been completed (Section C408.4.1) Service water heating equipment has been tested to ensure that control devices, components, equipment, and systems are calibrated, adjusted, and operate in accordance with approved plans and specifications <input type="checkbox"/> Pool and Spa Functional Testing has been completed (Section C408.4.1.3) Pools and spas have been tested to ensure service water heating equipment, time switches and heat recovery equipment are calibrated, adjusted and operate in accordance with approved plans and specifications <input type="checkbox"/> Metering System Functional Testing has been completed (Section C408.5.1) Energy source meters, energy end-use meters, the energy metering data acquisition system and required display are calibrated, adjusted and operate in accordance with approved plans and specifications
Supporting Documents (Section 408.1.3.2)	<input type="checkbox"/> Manuals, record documents and training have been completed or are scheduled <ul style="list-style-type: none"> • System documentation has been provided to the owner or scheduled date: _____ • Record documents have been submitted to owner or scheduled date: _____ • Training has been completed or scheduled date: _____
Commissioning Report (Section C408.1.2)	<input type="checkbox"/> Preliminary Commissioning Report submitted to Owner and includes items below. <ul style="list-style-type: none"> • Deficiencies found during testing required by this section which have not been corrected at the time of report preparation • Deferred tests, which cannot be performed at the time of report preparation due to climatic conditions

Project Information	Project Name:
	Project Address:
	Commissioning Authority:
Certification	<input type="checkbox"/> I hereby certify that all requirements for commissioning have been completed in accordance with the Washington State Energy Code, including all items above. <div style="display: flex; justify-content: space-between; width: 80%; margin-left: auto; margin-right: auto;"> _____ _____ </div> <div style="display: flex; justify-content: space-between; width: 80%; margin-left: auto; margin-right: auto;"> Building Owner or Owner's Representative Date </div>

SECTION 23 09 00 - INSTRUMENTATION AND CONTROL FOR HVAC

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Thermostats
 - 2. Electric actuators.
 - 3. Economizer Controls.
 - 4. Sensors

1.2 SCOPE

- A. The mechanical contractor shall install a complete, properly adjusted, and effective temperature control system.
- B. This section includes field assembled instrumentation and temperature controls for air conditioning, heating, ventilation, and exhaust systems.
- C. See drawings for Sequence of Operation.
- D. See Equipment Schedules and associated specification sections for controls integral to HVAC equipment.
- E. Controls shall be electric/electronic systems.
- F. Manufacturers of components shall be as specified, Honeywell, or approved.
- G. Any additional parts necessary to or incidental for a complete and operating system shall be the responsibility of the contractor.

1.3 MAINTENANCE SERVICE

- A. Furnish service and maintenance of control system for one year from Date of Substantial Completion.
- B. Furnish complete service of controls systems, including callbacks and service calls.
- C. Furnish two complete inspections per year, one in each season, to inspect, calibrate, and adjust controls. Submit written report after each inspection.
- D. Include systematic examination, adjustment, and lubrication of unit, and controls checkout and adjustments. Repair or replace parts in accordance with manufacturer's operating and maintenance data. Use parts produced by manufacturer of original equipment.
- E. Perform work without removing units from service during building normal occupied hours.
- F. Provide emergency call back service during working hours for this maintenance period.
- G. Maintain locally, near Place of the Work, adequate stock of parts for replacement or emergency purposes. Have personnel available to ensure fulfillment of this maintenance service, without unreasonable loss of time.

- H. Perform maintenance work using competent and qualified personnel under supervision and in direct employ of manufacturer or original installer.

1.4 QUALITY ASSURANCE

- A. Control Air Damper Performance: Test in accordance with AMCA 500.

1.5 SUBMITTALS

- A. Provide submittal to include one PDF of control components, control diagrams and operational sequences.

PART 2 PRODUCTS

2.1 THERMOSTATS

- A. Manufacturers: Honeywell (or as noted below) or approved equal.
- B. Bi-metal thermostats are not allowed for any application.
- C. Line Voltage Heating Thermostat (Programmable Electronic): King ESP230, Honeywell TL8230A or equal.
 - 1. Integral manual On/Off switch, single-pole.
 - 2. Accuracy: +/- 1.5 degrees F.
 - 3. Load / Motor capacity rating of 22 amps, 208/240 volt.
 - 4. Electronic thermistor temperature sensor with 40 F to 95 F range.
 - 5. 7-day independent programmable schedules with 4 daily setpoints.
 - 6. LCD display showing day, time, room temperature and setpoint, Green LED backlight, Red LED heat on Indicator, temperature adjustment buttons.
 - 7. Positive off position/function to serve as NEC required disconnect.
- D. Low Voltage Heating/Cooling Commercial Thermostat (Electronic Programmable Touchscreen): PECO T12532
 - 1. Remote Temperature Sensor: PECO 69308.
 - 2. Accuracy: +/- 1 degrees F.
 - 3. 24 VAC electrical with battery backup.
 - 4. LCD backlight touchscreen display.
 - 5. 7 day programmable.
 - 6. Individual heat and cool setpoints for both occupied and unoccupied.
 - 7. P+I+D temperature control.
 - 8. Auxiliary subbase connection for economizer control.
 - 9. 2 heat/2 cool conventional or 3 heat/2 cool heat pump operation.
 - 10. Heat-Off-Cool-Auto system selection.

2.2 OCCUPANCY SENSOR

- A. Manufacturers: Acuity, Eaton, Leviton or approved equal.
- B. Ceiling mounting Passive Infrared (PIR) sensor with 360° coverage. Adjustable time delay initially set for 15 min (adj). LED status indicator. 24VDC

2.3 TIME CLOCKS

- A. Seven-day programming switch timer with synchronous timing motor and seven-day dial. Continuously charged Ni-cad battery driven for power failure with 8-hour carry over and multiple switch trippers to control systems for minimum of two and maximum of eight signals each day with two normally open and two normally closed output switches.
- B. Solid state programmable time control with separate programs, 24-hour battery carry over, individual on/off/auto switches for each program, 7-day programming with 20 programmable holidays, choice of fail safe operation for each program and system fault alarm.

2.4 CONTROL AIR DAMPERS

- A. See Section 23 33 00.

2.5 ELECTRIC DAMPER ACTUATORS

- A. Manufacturers: Belimo or approved equal.
- B. Operation: Two-position, proportional or reversing type as required for application, spring-return.
- C. Enclosure Rating: NEMA 250 Type 2 Enclosure.
- D. Mounting: Direct mount.
- E. Stroke: 30 seconds end to end full stroke, 15 seconds return to normal for spring return.
- F. Protection: Electronic stall protection.
- G. Control Input: 0-10 VDC or 0-20 mA DC.
- H. Power: Nominal 24 \ 120 volt AC.
- I. Torque: Size for minimum 150 percent of required duty.
- J. Duty cycle: rated for 65,000 cycles.
- K. Accessories:
 - 1. Cover mounted transformer.
 - 2. Auxiliary potentiometer.
 - 3. Damper linkage.
 - 4. Direct drive feedback potentiometer.
 - 5. Output position feedback.
 - 6. Field selectable rotational, spring return direction, field adjustable zero and span.
 - 7. End switch.

2.6 CO2 SENSOR

- A. Manufacturer: AirTest Technologies TR929x series (1-888-855-8880) or approved equal.
- B. General: Gold plated non-dispersive infrared (NDIR) optical sensor with automatic baseline correction for self-calibration. Self-calibrating, temperature compensated for full range accuracy without manual calibration. 0-2000 ppm range. Wall mount (TR9294BL) or duct mount (TR9292BL).

- C. Quality: ISO-9001 manufactured. EMI protection EMC89/336/EEC, +/- 1% measured range accuracy, +3% measured value, T90 response time of less than 2 minutes.
- D. Output: CO2 concentration in ppm with selectable 0-10 VDC or 4-20mA. LCD display with readout in ppm.

2.7 ENCLOSURES

- A. All enclosures to be UL listed and all metal construction. All controls and instruments logically assembled at one or more panels.

2.8 CONTROL RELAYS

- A. Manufacturers: Functional Devices RIB or approved equal.
- B. Shall be rated for the application, with a minimum of two sets of Form C contacts, enclosed in a dust proof enclosure. Relays shall be rated for a minimum life of one million operations. Operating time shall be 20 milliseconds or less, with release time of 10 milliseconds or less. Relays should be equipped with coil transient suppression devices to limit transients to 150% of rated coil voltage.

2.9 WIRING

- A. Electric wiring and wiring connections required for the installation of the temperature control system as herein specified, shall be provided by the temperature control contractor. All wiring shall comply with the requirements of local and national electrical codes, and with applicable requirements of Electrical Division. Install all wiring in conduit.
- B. Line voltage wiring type and size shall be per NEC.
- C. Low voltage wiring type and size shall be per control manufacturer's recommendations based on application and length of run.

2.10 CONTROL POWER

- A. Provide transformers to supply power for control equipment operating at less than normal lighting circuit voltage. Do not connect wiring to lighting circuits.

PART 3 **EXECUTION**

3.1 EXAMINATION

- A. Verify building systems to be controlled are ready to operate.
- B. Verify air handling units and ductwork have been accepted and air filters are in place before installing sensors in air streams.
- C. Verify location of thermostats, humidistats and other exposed control sensors with Drawings before installation.

3.2 COORDINATION

- A. Furnish all control products to accomplish the specified sequence of operation, except those products specifically furnished under other sections.

- B. Install all control products and connections, except where already installed by the equipment manufacturer.
- C. Thermostats located in electrical transformer vaults shall be model approved by electrical utility.
- D. Coordinate provision of door contacts for interface with mechanical controls.

3.3 INSTALLATION

- A. General:
 - 1. Install controls by mechanics skilled in erection of control systems employed by and under direct supervision of control manufacturer's representative.
 - 2. Mount control equipment and devices as recommended by manufacturers and as shown on drawings; in case of conflicts between manufacturer's instructions and the drawings, consult the Project Manager for direction.
 - 3. Fasten all equipment securely to structure. Install equipment and exposed piping and conduit runs parallel to building lines, plumb and level.
- B. Wiring:
 - 1. Provide line voltage and/or low voltage wiring as required to serve the complete system; conform to code.
 - 2. Provide EMT or rigid conduit for exposed control wiring outside of cabinets or enclosures. Concealed low voltage wiring need not be in conduit, except in walls (see "3").
 - 3. Provide rigid conduit for control wiring concealed in partition walls, until conduit emerges from wall above ceilings.
 - 4. Run low voltage control wiring separate from line voltage wiring and segregate from other systems to avoid Electromagnetic Interference (EMI).
 - 5. All low voltage control wiring shall be homeruns between components without splices.
 - 6. Select wiring gauge based on length of run and power requirement for a maximum of 10% voltage drop.
- C. Install sleeves through concrete surfaces in minimum one-inch sleeves, extended 6 inches above floors and one inch below bottom surface of slabs.
- D. Install thermostats, humidistat, space temperature sensors, and other exposed control sensors after locations are coordinated with other Work.
- E. Install freeze protection thermostats using flanges and element holders.
- F. Install outdoor reset thermostats and outdoor sensors indoors, with sensing elements outdoors with sun shield.
- G. Provide separable sockets for liquids and flanges for air bulb elements.
- H. Install thermostats in aspirating boxes in public areas and as indicated on Drawings.
- I. Install control panels adjacent to associated equipment on vibration free walls or freestanding supports. Install engraved plastic nameplates for instruments and controls inside cabinet and engraved plastic nameplates on cabinet face.
- J. Install "hand/off/auto" selector switches to override automatic interlock controls when switch is in "hand" position.

3.4 THERMOSTATS AND SENSORS

- A. Mount thermostats and other human interface devices at 48" centerline above finished floor to comply with ADA accessibility per ANSI A117.1. Align thermostats and devices with light switches and other controls.
- B. Coordinate wall location of thermostats and other wall mount devices with light switches and controls provided by others. All devices in the same vicinity should be grouped at a common elevation with regular horizontal spacing intervals.
- C. Mount space CO2 sensors for room monitoring at 48" centerline above finished floor.

3.5 FIELD QUALITY CONTROL

- A. After completion of installation, start-up, test and adjust each system. Submit data showing set points, final adjustments of controls and compliance with sequence of operations.
- B. Conduct functional tests on complete systems, or individual portions as approved.
- C. Conduct operational tests; set controls to operating conditions, record settings and readings of each control device.
- D. Work in close coordination with testing and balancing Agency to set up control devices, set damper flow rates, and provide control system in perfect operating order. See Section 23 05 93.

3.6 DEMONSTRATION AND TRAINING

- A. Demonstrate complete operation of systems, including sequence of operation prior to Date of Substantial Completion.
- B. Not less than 60 days after beneficial occupancy by the Owner, recheck entire control system for compliance with Sequence of Operation.
- C. Recheck controls for proper operation at the start of the heating season, if other than above timing, and again during the first warm weather period following winter operation.

END OF SECTION

SECTION 23 23 00 - REFRIGERANT PIPING**PART 1 GENERAL****1.1 SUMMARY**

- A. Section Includes:
1. Refrigerant piping.
 2. Pipe insulation protection.
 3. Refrigerant moisture and liquid indicators.
 4. Valves.
 5. Refrigerant piping accessories.

1.2 SYSTEM DESCRIPTION

- A. Where more than one piping system material is specified, provide compatible system components and joints. Use non-conducting dielectric connections when joining dissimilar metals in systems.
- B. Provide flanges, unions, or couplings at locations requiring servicing. Use unions, flanges, or couplings downstream of valves and at equipment connections. Do not use direct welded or threaded connections to valves or equipment.
- C. Provide receivers on systems as required by manufacturer's installation instructions, sized to accommodate pump down charge.
- D. Provide receivers on systems with piping runs exceeding manufacturer's published limitations.
- E. Flexible Connectors: Use at spring isolated air handlers and condensers greater than six tons.
- F. Size piping in accord with equipment manufacturer's refrigerant piping design guidelines based on actual piping installation lengths. Use long line calculations when applicable.

1.3 QUALITY ASSURANCE

- A. Perform Work in accordance with ASME B31.5 code for installation of refrigerant piping systems.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Dehydrate and charge refrigeration components including piping and receivers, seal prior to shipment. Maintain seal until connected into system.
- B. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- C. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.

PART 2 PRODUCTS**2.1 REFRIGERANT PIPING**

- A. Copper Tubing: ASTM B280, Type ACR hard drawn or annealed.
1. Fittings: ASME B16.22 wrought copper.
 2. Joints: Braze, AWS A5.8 BCuP silver/phosphorus/copper alloy.

2.2 COPPER PRESSURE-SEAL FITTINGS FOR REFRIGERANT PIPING

- A. Manufacturers: RLS – Rapid Locking System, Nibco – PressACR, or approved equal.
- B. Flame-Free press fittings: UL 207 Listed. Refrigerant Grade Copper in accordance with ASTM B75 or ASTM B743. O-Rings: HNBR.
- C. Tools: Manufacturer's approved special tools.
- D. Ratings:
1. Maximum Rated Pressure (MRP): 700 psig.
 2. Continuous Operating Temperature: 250 deg F.
 3. O-Ring Temperature Rating: -40 to 300 deg F.
 4. Minimum Burst Pressure in accordance with UL 207: 2100 psig.
 5. Vacuum Pressure Capability: 20 Microns.
 6. Complies with UL 109 for vibration resistance.
 7. Approved for the following oils: POE, PVE, PAG.
- E. Approved Tubing Materials: Copper-to-copper connections with the following copper tubing:
1. Hard Drawn Copper, 1/4 to 1-3/8 inch (6.4 to 35 mm): Type ACR, L, K.
 2. Soft (Annealed) Copper 1/4 to 1-3/8 inch (6.4 to 35 mm): Type ACR, L, K.

2.3 REFRIGERANT LINE SET

- A. Copper Tubing: ASTM B280, annealed, Type ACR
1. Flared ends with brass nuts and protective caps.
 2. Pre-insulated, dual tube, liquid and vapor lines with closed-cell elastomeric foam.
 3. R-410A, 700 PSI rated.

2.4 PIPE INSULATION PROTECTION

- A. Manufacturers: Airex EFlex Guard or approved equal.
- B. Construction: Non-laminated flexible PVC with, antifungal and UV resistant properties.
1. Fire Performance: Testing Standard ASTM E 84 / UL 723.
 2. Rated Class "A" Material -25 Flame/450 smoke index
 3. Accelerated Weatherization and U. V. Testing Standard: ASTM G153
 4. Fungal resistance for interior & exterior: ASTM G21- "0" growth.
 5. Water/Vapor Permeability Testing Standard ASTM E96 Rated 1 ≤ perm.
 6. Rated Class II Vapor Retarder
 7. Tensile strength and Elongation for Vulcanized Rubber and Thermoplastic Elastomers ASTM D412.
- C. Fasteners: No material shall be cemented or applied by adhesives.
1. Reusable, Heavy-Duty, Dual-Bonded Velcro fasteners and U. V. Cable Ties.

2. Velcro fasteners construction method: Molecular Fusion bonded and double stitched.

D. Color: Black or White

E. Install per Airex Manufacturing Inc. Instructions.

2.5 REFRIGERANT PIPE WALL PENETRATION GASKET SEAL

A. Manufacturers: Airex TGS or approved equal.

B. Construction: ASA (Acrylonitrile Styrene Acrylate) outdoor Polymer. High impact strength material, UV resistant, and extreme weather resistant material. UL 746C (rated F1). Built-in pitch or slope design away from the exterior wall to prevent water or moisture build-up.

C. Wall Gasket Seal System receiver shall be attached to the building wall with the use of screws for self-tapping, concrete, plaster, mortar, and all materials and to include 2,000 lbs. (psi) pull rating. The screws are to be pre-loaded with neoprene washers for an air-tight seal.

D. The wall trim receiver shall have a surface edge perimeter pre-mounted gasket for proper wall sealing and a mounted duct seal that is highly flexible and that properly receives, and seals, with an tight fit around the insulated line set with an elastomeric sleeve.

E. There shall be combined holding action by the elastomeric sleeve with an outside diameter, adjustable stainless steel clamp, to create a fully isolated, supported, sealed, and secured penetrating line set connection.

F. Installation shall be according to Airex Manufacturing installation instructions.

G. Color: Gray or White (Paintable)

2.6 UNIONS, FLANGES, AND COUPLINGS

A. Copper Pipe: Bronze, soldered joints.

2.7 REFRIGERANT MOISTURE AND LIQUID INDICATORS

A. Manufacturers: Alco Controls, Parker Hannifin, Sporlan Valve or approved equal.

B. Indicators:

1. Port: Single, UL listed.
2. Body: Copper or brass, flared or solder ends.
3. Sight glass: Color-coded paper moisture indicator and plastic cap.
4. Maximum working pressure: 500 psig
5. Maximum working temperature: 200 degrees F.

2.8 VALVES

A. Manufacturers: Alco Controls, Parker Hannifin, Sporlan Valve or approved equal.

B. Diaphragm Packless Valve:

1. UL listed for refrigeration service.
2. Globe or angle pattern, forged brass body and bonnet solder or flared ends.
3. Phosphor bronze and stainless steel diaphragms, rising stem and hand wheel.

4. Stainless steel spring, nylon seats, disc with positive back seating.
 5. Maximum working pressure: 500 psig.
 6. Maximum working temperature: 275 degrees F.
- C. Packed Angle Valve:
1. Forged brass, solder or flared ends.
 2. Forged brass seal caps with copper gasket, rising stem and seat, molded stem packing.
 3. Maximum working pressure: 500 psig.
 4. Maximum working temperature: 275 degrees F.
- D. Ball Valves:
1. Two piece forged brass body with teflon ball seals and copper tube extensions, brass bonnet and seal cap, chrome plated ball, stem with neoprene ring stem seals.
 2. Maximum working pressure: 500 psig.
 3. Maximum working temperature: 300 degrees F.
- E. Service Valve:
1. Forged brass body with copper stubs, brass caps, removable valve core, integral ball check valve.
 2. Maximum working pressure: 500 psig.
 3. Maximum working temperature: 300 degrees F.
- F. Globe Check Valve:
1. Cast bronze or forged brass body, forged brass cap with neoprene seal, brass guide and disc holder, phosphor-bronze or stainless steel spring, teflon seat disc.
 2. Maximum working pressure: 500 psig.
 3. Maximum working temperature: 300 degrees F.
- G. Straight Through Check Valve:
1. Spring, neoprene seat.
 2. Maximum working pressure: 500 psig.
 3. Maximum working temperature: 250 degrees F.
- 2.9 REFRIGERANT PIPING SERVICE VALVE
- A. Manufacturer: Diamondback or approved equal.
 - B. Full port, forged brass ball valve with Schrader valve, flare connections, Teflon seals and gaskets. 700 psig rated, R-410A compatible, fully factory assembled and pressure tested.
 - C. Provide with insulation cover of polyethylene foam with PVC cover and tape.
- 2.10 REFRIGERANT STRAINERS
- A. Manufacturers: Alco Controls, Parker Hannifin, Sporlan Valve or approved equal.
 - B. Straight Line or Angle Line Type:
 1. Brass or steel shell, steel cap and flange, and replaceable cartridge, with screen of stainless steel wire or monel reinforced with brass.

2.11 REFRIGERANT FILTER-DRYERS

- A. Manufacturers: Alco Controls, Parker Hannifin, Sporlan Valve or approved equal.
- B. Replaceable Cartridge Angle Type:
 - 1. For systems six tons and larger.
 - 2. Shell: ARI 710, UL listed, brass or steel, removable cap, for maximum working pressure of 500 psig.
 - 3. Filter Cartridge: Pleated media with integral end rings, stainless steel support.
 - 4. Filter/Dryer Cartridge: Pleated media with solid core sieve with activated alumina.
 - 5. Wax Removal Cartridge: Molded bonded core of activated charcoal with integral gaskets.
- C. Permanent Straight Through Type:
 - 1. ARI 710, UL listed, steel shell with molded desiccant filter core, for maximum working pressure of 500 psig.
 - 2. Rating: ARI 710 moisture rating, ARI 730 flow capacity.

2.12 REFRIGERANT SOLENOID VALVES

- A. Manufacturers: Alco Controls, Parker Hannifin, Sporlan Valve or approved equal.
- B. Valve: ARI 760, pilot operated, copper or brass body and internal parts, synthetic seat, stainless steel stem and plunger assembly, integral strainer, with flared, solder, or threaded ends; for maximum working pressure of 500 psig. Stem designed to allow manual operation in case of coil failure.
- C. Coil Assembly: UL listed, replaceable with molded electromagnetic coil, moisture and fungus proof, with surge protector and color coded lead wires, integral junction box.

2.13 FLEXIBLE PIPE CONNECTORS

- A. Manufacturers: Packless Ind, Metraflex, Mason or approved equal.
- B. Braided Refrigeration Piping Connection
 - 1. Bronze flexible hose and bronze braided outer covering.
 - 2. Copper sweat connections, cleaned de-greased, and bagged.
 - 3. R410a rated, 650 psi working pressure.

2.14 ROOF PIPE PORTAL

- A. Manufacturers: RPH Vault or approved equal.
- B. Powder coated heavy gauge aluminum assembly. Vandal resistant lid. Pre-insulated housing, R4.3 insulation. Insulation extension and curb. Stainless steel screws.
- C. Weather-tight Silx14 exit seals for pipe penetrations. UV resistant, 20-year warranty.
- D. Order size based on number of pipe penetrations. Allow for additional power and control conduit penetrations.

PART 3 **EXECUTION**

3.1 PREPARATION

- A. Ream pipe and tube ends. Remove burrs.
- B. Remove scale and dirt on inside and outside before assembly.
- C. Prepare piping connections to equipment with flanges or unions.
- D. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.

3.2 INSTALLATION PIPING SYSTEMS

- A. Route piping parallel to building structure and maintain gradient.
- B. Install piping to conserve building space, and not interfere with use of space.
- C. Group piping whenever practical at common elevations.
- D. Sleeve pipe passing through partitions, walls and floors.
- E. Protection: Where piping, other than cast iron or steel, is installed in a concealed location through holes or notches in framing (i.e. studs, joists, rafters, etc.), less than 1-1/2 from framing edge, provide shield plates. Shield plates shall be 16 gauge steel and cover the piping area within framing plus 2" on each side along framing.
- F. Use rigid Armacell Armafix pipe clamp assembly at all supports.
- G. Determine equivalent line length and size piping per manufacturer's installation instructions. Provide solenoid valve and other required piping accessories for long line installation.
- H. Refrigerant piping shall not be installed in elevators, public stairways, stair landing or means of egress spaces.
- I. Install pipe identification.
- J. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- K. Provide access where valves and fittings are not exposed.
- L. Arrange refrigerant piping to return oil to compressor. Provide traps and loops in piping, and provide double risers as required. Slope horizontal piping 0.40 percent in direction of flow.
- M. Flood refrigerant piping system with nitrogen during brazing. Keep piping open with nitrogen flow for zero pressure while brazing.
- N. Install valves with stems upright or horizontal, not inverted.
- O. Insulate piping and equipment.

- P. Provide replaceable cartridge filter-dryers, with isolation valves and bypass with valve.
- Q. Locate expansion valve sensing bulb immediately downstream of evaporator on suction line.
- R. Provide external equalizer piping on expansion valves with refrigerant distributor connected to evaporator.
- S. Install flexible connectors at right angles to axial movement of compressor, parallel to crankshaft.
- T. Fully charge completed system with refrigerant after testing.
- U. Follow ASHRAE 15 procedures for charging and purging of systems and for disposal of refrigerant.
- V. Install refrigerant piping in accordance with ASME B31.5.

3.3 INSTALLATION-EXTERIOR PIPING

- A. Protect exterior piping with application specific piping protection cover system, continuous aluminum jacket or field fabricated GSM cover with steel angle supports.
- B. Provide waterproof pipe entry into building with trim and flashing.

3.4 INSTALLATION - REFRIGERANT SPECIALTIES

- A. Refrigerant Liquid Indicators: Install line size liquid indicators in main liquid line downstream of condenser.
- B. Refrigerant Valves: Install service valves on compressor suction and discharge.
- C. Strainers: Install shut-off valves on each side of strainer.
- D. Install pressure relief valves on ASME receivers. Install relief valve discharge piping to terminate outdoors.
- E. Filter-Dryers:
 - 1. Install permanent filter-dryers in low temperature systems.
 - 2. Install permanent filter-dryer in systems containing hermetic compressors.
 - 3. Install replaceable cartridge filter-dryer vertically in liquid line adjacent to receivers.
 - 4. Install replaceable cartridge filter-dryer upstream of each solenoid valve.
- F. Solenoid Valves:
 - 1. Install in liquid line of systems operating with single pump-out or pump-down compressor control.
 - 2. Install in liquid line of single or multiple evaporator systems.

3.5 FIELD QUALITY CONTROL

- A. Test refrigeration system in accordance with ASME B31.5.
- B. Pressure test refrigeration system with dry nitrogen to 400 psig. Perform final tests at 27 inches vacuum and 400 psig using halide torch or electronic leak detector.

- C. Repair leaks.
- D. Retest until no leaks are detected.

END OF SECTION

SECTION 23 31 00 - HVAC DUCTS AND CASINGS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Ductwork
 - 2. Kitchen Grease Ductwork
 - 3. Duct Sealant
 - 4. Fabrication
 - 5. Duct Pressure Testing

1.2 PERFORMANCE REQUIREMENTS

- A. Variation of duct configuration or sizes other than those of equivalent or lower loss coefficient is not permitted except by written permission. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts.
- B. Standards: Comply with most stringent requirements and recommendations of International Mechanical Code or SMACNA (Sheet Metal and Air Conditioning Contractors National Association) Duct Construction Standards for fabrication, construction and sealant of duct, fittings, and accessories.
- C. Construct ductwork to NFPA 90A.
- D. Construct commercial kitchen ductwork to NFPA 96.

1.3 ENVIRONMENTAL REQUIREMENTS

- A. Do not install duct sealant when temperatures are less than those recommended by sealant manufacturers.
- B. Maintain temperatures during and after installation of duct sealant.

1.4 DEFINITIONS

- A. Black Carbon Steel: Plain carbon steel which is not galvanized or oiled.

PART 2 PRODUCTS

2.1 DUCT MATERIALS

- A. Galvanized Steel Ducts: ASTM A653 galvanized steel sheet, lock-forming quality, having G60 zinc coating of in conformance with ASTM A90.
- B. Aluminum Ducts: ASTM B209; aluminum sheet, alloy 3003-H14. Aluminum Connectors and Bar Stock: Alloy 6061-T6 or of equivalent strength.
- C. Fasteners: Rivets, bolts, or sheet metal screws.
- D. Hanger Rod: ASTM A36; steel, galvanized; threaded both ends, threaded one end, or continuously threaded.

2.2 INSULATED FLEXIBLE DUCTS [GRD CONNECTION]

- A. Manufacturers: Thermaflex G-KM or approved equal.
- B. Product Description: Black polymer film supported by helical-wound spring steel wire; fiberglass insulation; polyethylene vapor barrier film, UL 181 Class 1 complying with NFPA 90A & 90B.
 - 1. Pressure Rating: 6 inches wg positive and 1 inches wg negative.
 - 2. Maximum Velocity: 5000 fpm.
 - 3. Temperature Range: -20 degrees F to 250 degrees F.
 - 4. Thermal Resistance: R-4.2
- C. Accessories:
 - 1. Hanger Strap: Thermaflex FlexTie – 1-1/2" wide, adjustable, plenum rated.
 - 2. Elbow: Thermaflex FlexFlow Elbow or Malco flexible duct support – One-piece adjustable design installs over flex duct.

2.3 INSULATED FLEXIBLE DUCTS [GRD CONNECTION]

- A. Manufacturers: Thermaflex M-KC or approved equal.
- B. Product Description: Insulated assembly with inner duct of woven and coated fiberglass permanently bonded to coated steel wire helix, 1" fiberglass insulation and vapor barrier jacket of fiberglass reinforced metallized film laminate, UL 181 Class 1 complying with NFPA 90A & 90B.
 - 1. Pressure Rating: 10 inches wg positive and 2 inches wg negative.
 - 2. Maximum Velocity: 6000 fpm.
 - 3. Temperature Range: -20 degrees F to 250 degrees F.
 - 4. Thermal Resistance: R-4.2
- C. Accessories:
 - 1. Hanger Strap: Thermaflex FlexTie – 1-1/2" wide, adjustable, plenum rated.
 - 2. Elbow: Thermaflex FlexFlow Elbow or Malco flexible duct support – One piece adjustable design installs over flex duct.

2.4 INSULATED FLEXIBLE DUCTS [GRD CONNECTION]

- A. Manufacturers: Flexmaster 6M or approved equal.
- B. Product Description: Insulated assembly with inner duct of spunbond nylon fabric mechanically locked, without adhesives to galvanized steel wire helix, 1" fiberglass insulation and vapor barrier jacket of fiberglass reinforced aluminum film laminate, UL 181 Class 1 complying with NFPA 90A & 90B.
 - 1. Pressure Rating: 6 inches wg positive and 5 inches wg negative.
 - 2. Maximum Velocity: 5500 fpm.
 - 3. Temperature Range: -20 degrees F to 250 degrees F.
 - 4. Thermal Resistance: R-4.2
 - 5. Insertion Loss dB (6" dia, 3 ft): 2.3, 4.9, 5.3, 5.3, 5.5, 5.8, 5.4
- C. Accessories:
 - 1. Hanger Strap: Thermaflex FlexTie – 1-1/2" wide, adjustable, plenum rated.
 - 2. Elbow: Thermaflex FlexFlow Elbow or Malco flexible duct support – One-piece adjustable design installs over flex duct.

2.5 SINGLE WALL SPIRAL ROUND DUCTS

- A. Manufacturers: McGill AirFlow, Semco or approved equal.
- B. Product Description: UL 181, Class 1, round spiral lockseam duct constructed of galvanized steel.
- C. Joints: 16" and larger flange with gasket material.
- D. Elbows: Smooth radius or 5 section, 1.5D.
- E. Application: Required for all exposed round ductwork; all round ductwork 12" dia. and larger; all round ductwork with static pressure over 1" w.g.. Optional for all round ductwork.
- F. Construct duct with the following minimum gages:

Diameter	Gauge
3 inches to 14 inches	26
15 inches to 26 inches	24
28 inches to 36 inches	22

- G. Construct fittings with the following minimum gages:

Diameter	Gauge
3 inches to 14 inches	24
15 inches to 26 inches	22
28 inches to 36 inches	20

2.6 SINGLE WALL ROUND DUCTS

- A. Manufacturers: Ductmate GreenSeam+ or approved equal.
- B. Product Description: Snap lock round duct with self-sealing butyl rubber longitudinal seam and polyurethane gasket transverse seam. No external sealant. No VOCs.
- C. Joints: Male/Female with integral gasket.
- D. Elbows: Smooth radius, 1.5D.
- E. Application: Only allowed for low pressure ductwork with static pressure of 1" w.g. or less, less than 10" diameter and concealed. Not for use exposed.
- F. Construct duct with the following minimum gages:

Diameter	Gauge
4 inches to 10 inches	26

- G. Construct fittings with the following minimum gages:

Diameter	Gauge
4 inches to 10 inches	24

2.7 SINGLE WALL ROUND DUCTS (SNAP-LOCK)

- A. Product Description: [Product not acceptable for use.]
- B. Application: Residential dwelling unit venting only, concealed.

2.8 SINGLE WALL SPIRAL FLAT OVAL DUCTS

- A. Manufacturers: McGill AirFlow, Semco or approved equal.
- B. Product Description: Machine made from round spiral lockseam duct constructed of galvanized steel; rated for 10 inches wg pressure.
- C. Joints: Either fully welded or bolted flange with gasket material.
- D. Application: All flat oval ducts.
- E. Construct duct with the following minimum gauges:

Major Axis Dimension	Gauge
7 inches to 24 inches	24
25 inches to 48 inches	22

- F. Construct fittings with the following minimum gauges:

Major Axis Fitting Dimension	Gauge
7 inches to 36 inches	20

2.9 EXTERIOR FACTORY BUILT DUCTS

- A. Manufacturers: Therma duct or approved equal.
- B. Pre-insulated duct system: Closed cell phenolic insulation, 1000-micron vinyl cladding, aluminum foil scrim vapor barrier and 4-bolt gasketed flange joints with protective covers.
- C. Provide factory installed internal reinforcement based on duct size, static pressure and external loading.
- D. Provide turning vanes on all 90-degree elbows.
- E. Specifications:
 - 1. UL 181 Listed
 - 2. 5000 fpm velocity
 - 3. +/- 6 in wc pressure
 - 4. 0.00 perms maximum per ASTM E 96
 - 5. 10 year warranty
 - 6. Minimum insulation R-8.1

2.10 DUCT SEALANT

- A. Manufacturer: Design Polymerics, United McGill or approved equal.
- B. Sealant shall be water based and formulated to withstand working temperatures of -25°F to +200°F. All sealants shall exceed 500 hours under ASTM C 732 (artificial weathering) and pass ASTM C 734 (low temperature flexibility after artificial weathering). All sealants shall be of an elastomeric nature, have a weight per gallon not to exceed 12.5, have

solids by weight of 66% \pm 2%, pass UL 723 with a flame spread of 5 and smoke developed of 5.

2.11 DUCTWORK FABRICATION

- A. Fabricate and support rectangular and round ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible. Provide duct material, gages, reinforcing, and sealing for operating pressures corresponding to the ESP (external static pressure) of the fan system. i.e. Ductwork for a fan with and ESP of 0.75" w.g. should be constructed per SMACNA 1" w.g. pressure standard.
- B. Construct T's, bends, and elbows with minimum radius 1-1/2 times centerline duct width. Where not possible and where rectangular elbows are used, provide airfoil turning vanes. Where acoustical lining is indicated, furnish turning vanes of perforated metal with glass fiber insulation.
- C. Indicated dimensions on drawings are net inside. Allow for thickness of duct lining where indicated.
- D. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
- E. Fabricate continuously welded round and oval duct fittings two gages heavier than duct gages indicated in SMACNA Standard. Minimum 4 inch cemented slip joint, brazed or electric welded. Prime coat welded joints.
- F. Provide standard 45-degree lateral wye takeoffs. When space does not allow 45-degree lateral wye takeoff, use 90-degree conical tee connections.

2.12 CLOTHES DRYER EXHAUST DUCTWORK

- A. Rigid galvanized sheet metal of minimum 26 gauge with smooth interior finish.

2.13 KITCHEN HOOD GREASE EXHAUST DUCTWORK (FACTORY-BUILT)

- A. Manufacturers: Selkirk ZeroClear, Metal-Fab 3G or approved equal.
- B. Factory-built kitchen grease duct with 2 hr fire rated, zero clearance. UL 1978 and UL 2221 listed.
- C. Double wall construction with 3" high temp insulation, stainless steel inner wall and aluminized steel outer wall.
- D. Provide complete factory system including joints, fittings, sealant, cleanouts, access panels, drains, supports/guides, thimbles, and fan termination adapter.

2.14 KITCHEN HOOD EXHAUST DUCTWORK FABRICATION

- A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible and NFPA 96.
- B. Exposed Kitchen Hood Exhaust Ducts: Construct of stainless steel ASTM A167, type 304 \ 316 using continuous external welded joints.

- C. Concealed Kitchen Hood Exhaust Ducts: Construct of 16 gage carbon steel or 18 gage stainless steel ASTM A167, type 304 \ 316 using continuous external welded joints.
- D. Exterior Kitchen Hood Exhaust Ducts: Construct of stainless steel ASTM A167, type 304 \ 316 using continuous external welded joints.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify sizes of equipment connections before fabricating transitions.

3.2 INSTALLATION

- A. Make field measurements to establish locations of hangers and supports where installation will not damage building construction.
- B. During construction, install temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.
- C. Where ducts pass through partitions, ceilings or floors. Provide 1" clearance and insulate from structure with insulation material. Provide flanged sheet metal closure.
- D. Where ducts pass through rated walls or assemblies without fire dampers, provide ¼" to 1" annular space and fill with firestop sealant. Ductwork shall be minimum 26 gauge metal.
- E. Isolate joints between dissimilar metals with fiber gasket.
- F. Drawings do not attempt to show all offsets in ductwork. Make such offsets as necessary for installation of work without additional cost to Owner. 15 degree maximum angle of offset.
- G. Exterior Ductwork:
 - 1. Construct one gauge heavier than SMACNA standard for size indicated.
 - 2. Seal all joints and seams with heavy mastic. Duct shall be water tight.
 - 3. Construct to prevent standing water on duct.
- H. Exposed ductwork shall be Appearance Grade. Ductwork located in crawl spaces, shafts, and suspended ceiling spaces are not considered exposed.
 - 1. All round ductwork shall be spiral seam (no snap-lock joints).
 - 2. All joints clean and workmanlike.
 - 3. Ductwork entirely free of dents.
 - 4. Ductwork subject to denting due to space function construct one gauge heavier than SMACNA standard for size indicated.
 - 5. All hangers trimmed of excess metal.
 - 6. Plumb, level, parallel or perpendicular to building structure.
 - 7. Sealed with transparent, paintable sealant to avoid streaking.
- I. Flexible Duct:
 - 1. Install insulated flexible duct in full extended condition free of sags and kinks.
 - 2. Use minimum length required to make connection.
 - 3. Length shall not exceed 10 feet.
 - 4. Supported on 36" centers with minimum 1-1/2" wide strap. Do not crush.
 - 5. Connect flexible ducts to metal ducts with draw bands.

- J. Install duct hangers and supports in accordance with Section 23 05 00.
- K. Use double nuts and lock washers on threaded rod supports.
- L. Set plenum doors 6 to 12 inches above floor. Arrange door swing so fan static pressure holds door in closed position.

3.3 SEISMIC BRACING

- A. See 23 05 00.

3.4 DUCT SEALING

- A. Install and seal ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible. Ductwork shall be sealed using welds, gaskets, or mastic. Duct tape is not permitted as a sealant on any ducts with the exception of that on fiberglass ducts specifically made for such use.
- B. For all ductwork seal all transverse joints and longitudinal seams. For 2" w.g. and higher pressure class ductwork also seal all duct wall penetrations (i.e. screw, fastener, rod or wire).
- C. Low pressure ductwork (less than 3" w.g.) shall be sealed to a leakage rate not to exceed 6 percent of the system airflow. All deficient ductwork shall be re-sealed until compliant.

3.5 PRESSURE (DUCT LEAKAGE) TESTING

- A. Perform duct leakage rate testing in accordance with SMACNA Duct Leakage Test Procedures for the following.
 - 1. All ductwork regardless of pressure class located exterior of the building or in an unconditioned space shall have a leakage rate of less than 6%.
 - 2. At least 25% of all ductwork with a pressure class of 3" w.g. or more. The maximum duct leakage (CL) shall be 4.0 per Energy Code C403.2.8.3.3.
- B. All ductwork found deficient by testing shall be resealed and retested until leakage compliance is reached.
- C. Provide written documentation of testing to be included with the Test and Balance report, see 23 05 93. Include drawing(s) indicating where test measurements were taken.

3.6 CLOTHES DRYER DUCT INSTALLATION

- A. Ducts shall terminate outside the building and be equipped with a backdraft damper. No screens shall be used at termination.
- B. Ducts shall not be constructed with sheet metal screws or other fasteners that enter the airstream. Ductwork shall be metal with smooth interior finish. The male end of duct joints shall extend in the direction of airflow.
- C. Dryer ducts which penetrate a wall of ceiling membrane shall be fire caulked.
- D. Dryer ducts shall be supported at minimum 4 foot intervals and secured in place.
- E. Provide protective shield plates where duct is in concealed locations within framing. Plates shall be 16 gage steel and cover the duct area plus 2". Shields may be omitted if duct is more than 1-1/2" from nearest edge of structural member.

3.7 KITCHEN HOOD EXHAUST DUCT INSTALLATION

- A. Install kitchen range hoods and ductwork in accordance with NFPA 96.
- B. Install residue traps in kitchen hood exhaust ducts at base of vertical risers with provisions for clean out.
- C. Kitchen hood exhaust ducts: Use stainless steel for ductwork exposed to view and stainless steel or black carbon steel where ducts are concealed indoors. All exterior ductwork shall be stainless steel.
- D. Prior to duct concealment perform light leakage test on entire duct and duct to hood connection per requirements of IMC 506.3.2.5. Each weld and joint shall be inspected. If any leaks are detected, repair and retest section. Tests shall be witness and documented by the Commissioning Agent.
- E. Exhaust duct shall extend a minimum of 18" above roof surface and terminate with a flange and gasket at base of exhaust fan.

3.8 EXTERIOR FACTORY BUILT DUCTS INSTALLATION

- A. Provide factory shop drawings, drawn to scale, indicating layout, sizes, fittings, transitions, penetrations and connection to other work.
- B. Fabrication of all duct segments and fittings shall conform to SMACNA "Duct Construction Standards".
- C. Duct construction shall exceed requirements for snow and wind loads.
- D. Installing contractor shall receive factory training and support to comply with manufacturer's installation instructions.
- E. Support ductwork per manufacturer's instruction on maximum 13 foot centers, with additional supports at changes of direction, branch ducts and installed accessories.
- F. Provide manufacturer's representative inspection and written report indicating installation compliance. Replace any ductwork which does not comply.

3.9 INTERFACE WITH OTHER PRODUCTS

- A. Install openings in ductwork where required to accommodate thermometers and controllers. Install pitot tube openings for testing of systems. Install pitot tube complete with metal can with spring device or screw to prevent air leakage. Where openings are provided in insulated ductwork, install insulation material inside metal ring.
- B. Connect diffusers or light troffer boots to low pressure ducts with 5 feet maximum length of flexible duct held in place with strap or clamp.
- C. Connect air outlets and inlets to supply ducts with five foot maximum length of flexible duct. Do not use flexible duct to change direction.

3.10 CLEANING

- A. Clean duct system and force air at high velocity through duct to remove accumulated dust. To obtain sufficient air flow, clean one half of system completely before proceeding

to other half. Protect equipment with potential to be harmed by excessive dirt with temporary filters, or bypass during cleaning.

3.11 SCHEDULES

A. Ductwork Material Schedule:

AIR SYSTEM	MATERIAL
Supply, Return, Exhaust, Relief	Galvanized Steel, Aluminum
Kitchen Hood Exhaust	Black Carbon Steel, Stainless Steel
Outside Air Intake	Galvanized Steel
Exterior	Aluminum, Stainless Steel

B. Ductwork Pressure Class Schedule: Install higher pressure class than indicated where corresponding fan system ESP (external static pressure) is higher.

AIR SYSTEM	PRESSURE CLASS
Constant Volume Low Pressure Supply	Minimum 1 inch wg.
Return, Exhaust	Minimum 1 inch wg

END OF SECTION

SECTION 23 33 00 - AIR DUCT ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Dampers
 - 2. Dryer Box
 - 3. Duct access doors
 - 4. Flexible duct connections
 - 5. Pressure gages

1.2 COORDINATION

- A. Verify locations for access panels with Architect.
- B. Coordinate damper power, control and fire alarm interface with other trades.
- C. See 23 09 00 for Electric Damper Actuators.

1.3 QUALITY ASSURANCE

- A. Dampers tested, rated and labeled in accordance with the latest UL requirements.
- B. Damper pressure drop ratings based on tests and procedures performed in accordance with AMCA 500.

PART 2 PRODUCTS

2.1 MANUAL BALANCING DAMPERS

- A. Manufacturers: Ruskin, Greenheck or approved equal
- B. Frames: Galvanized steel, minimum 20 gage.
- C. Blades: Galvanized steel, minimum 20 gage, attached to minimum 3/8 inch shafts with locking handle quadrant. Provide 2" standoff for insulated ductwork applications.
- D. Maximum Velocity: 1500 fpm.
- E. Rectangular: 24" and under on a side Ruskin MD25; over 24" on a side Ruskin MD35 or equal.
- F. Round: Ruskin MDRS25 or equal.

2.2 CONTROL DAMPERS

- A. Manufacturers: Tamco, Ruskin, Greenheck or approved equal
- B. Frame: Extruded aluminum (6063T5) channel of minimum 0.080" thickness with mounting flanges on both sides.

- C. Blades: Extruded aluminum (6063T5) airfoil. Maximum blade size 6 inches wide, 48 inches long, attached to minimum 7/16 inch hex shafts.
- D. Bearings: Celcon inner bearing fixed to blade pin, rotating within a polycarbonate outer bearing inserted in the frame.
- E. Seals: EPDM blade seals and silicone frame seals.
- F. Damper Leakage: AMCA Pressure Class 1A, maximum leakage rate of 3.0 cfm/ft² at 1.0 inch w.g. pressure differential.
- G. Maximum Pressure Differential: 6 inches w.g.
- H. Rectangular: Tamco 1000, Ruskin CD50, Greenheck VCD-43 or equal.
- I. Round: Ruskin CDRS25, Greenheck VCDR-53 or equal up to 12" diameter, for larger sizes use rectangular damper with manufacturer's square-to-round transitions.
- J. Options:
 - 1. For dampers with a dimension over 48" provide multiple sections with jack shafts.
 - 2. Provide parallel blade action for two position (open/closed) applications.
 - 3. Provide opposed blade action for modulation or control applications.

2.3 INSULATED CONTROL DAMPERS

- A. Manufacturers: Tamco, Ruskin, Greenheck or approved equal
- B. Frame: Insulated extruded aluminum (6063T5) channel of minimum 0.080" thickness with mounting flanges on both sides.
- C. Blades: Extruded aluminum (6063T5) airfoil internally insulated with expanded polyurethane foam and thermally broken. Maximum blade size 6 inches wide, 48 inches long, attached to minimum 7/16 inch hex shafts.
- D. Bearings: Celcon inner bearing fixed to blade pin, rotating within a polycarbonate outer bearing inserted in the frame.
- E. Seals: EPDM blade seals and silicone frame seals.
- F. Damper Leakage: AMCA Pressure Class 1A, maximum leakage rate of 3.0 cfm/ft² at 1.0 inch w.g. pressure differential.
- G. Maximum Pressure Differential: 6 inches w.g.
- H. Rectangular Insulated: Tamco 9000, Ruskin CDTI-50, Greenheck ICD-44 or equal.
- I. Round: Provide rectangular damper with manufacturer's square-to-round transitions.
- J. Options:
 - 1. For dampers with a dimension over 48" provide multiple sections with jack shafts.
 - 2. Provide parallel blade action for two position (open/closed) applications.
 - 3. Provide opposed blade action for modulation or control applications.

2.4 REMOTE OPERATED BALANCING DAMPERS (MANUAL)

- A. Manufacturers: Young, MAT or approved equal.

- B. Damper:
 - 1. Round butterfly or radial damper with external control hardware, 5020-CC, RT-250.
 - 2. Round butterfly or radial damper with internal control hardware, 5020-CC-2, RT-150.
 - 3. Rectangular opposed blade damper with external control hardware, 830A-CC, RT-200.
 - 4. Rectangular opposed blade damper with internal control hardware, 830A-CC-2, RT-100.
- C. Remote Damper Operator:
 - 1. External cable control, 3" cover plate, 270-301
 - 2. Internal cable control, 270-275
 - 3. Remote cable wall control, 700 (where indicated).

2.5 REMOTE OPERATED BALANCING DAMPERS (ACTUATED)

- A. Manufacturers: United Enertech, MAT or approved equal.
- B. Damper:
 - 1. Round butterfly or radial damper.
 - 2. Rectangular opposed blade damper.
- C. Actuator:
 - 1. Low voltage actuator.
 - 2. Plenum rated low voltage wiring.
 - 3. Hand held controller/power source with damper position indicator.
- D. Accessories:
 - 1. Ceiling cover plate
 - 2. Furnish (1) one hand held controller to owner.

2.6 COMBINATION FIRE AND SMOKE DAMPERS (INLINE)

- A. Manufacturers: Ruskin FSD60/FSD60LP, FSDR60, equal by Greenheck, or approved equal.
- B. Application: Provide FSD60LP (low pressure) model for dampers 14" in height and smaller. Provide FSDR60 for round ducts. All others provide standard FSD60.
- C. Fabricate in accordance with NFPA 90A, UL 555, and UL 555S.
- D. Fire Resistance: 1-1/2 hours or 3 hours depending on rating of wall.
- E. Leakage Rating: Class I, maximum of 8 cfm at 4 inches w.g. differential pressure.
- F. Damper Temperature Rating: 350 degrees F.
- G. Frame: 16 gage, galvanized steel.
- H. Blades:
 - 1. Style: Airfoil-shaped, single piece, double skin.
 - 2. Action: Opposed.
 - 3. Orientation: Horizontal.
 - 4. Material: Minimum 16 gage equivalent thickness, galvanized steel.
 - 5. Width: Maximum 7 inches.

- I. Bearings: Stainless steel or bronze.
 - J. Seals: Silicone blade edge seals and flexible stainless steel jamb seals.
 - K. Linkage: Concealed in frame.
 - L. Provide with duct transition connection.
 - M. Release Device: Close in controlled manner and allow damper to be reset.
 - N. Actuator: Belimo, electric 120 volt, 60 hertz, two-position, fail close.
 - O. Resettable Link Release Temperature: 165 degrees F.
 - P. Factory installed sleeve and mounting angles. Furnish silicone caulk factory applied to sleeve at damper frame to comply with leakage rating requirements.
 - Q. Accessories:
 - 1. Damper Test Switch
- 2.7 DRYER BOX
- A. Manufacturers: Guy Gray, In-O-Vate Technologies or approved equal.
 - B. 22 gauge aluminized steel manufactured wall recessed dryer vent hose receptacle with opening for 4" dia. duct and gas line. UL Classified for a one hour wall. Installation per manufacturer's instructions.
- 2.8 DUCT ACCESS DOORS
- A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.
 - B. Fabrication: Rigid and close fitting of galvanized steel with sealing gaskets and quick fastening locking devices. For insulated ductwork, furnish minimum 1 inch thick insulation with sheet metal cover.
 - 1. Less than 12 inches square, secure with sash locks.
 - 2. Up to 18 inches Square: Furnish two hinges and two sash locks.
 - 3. Up to 24 x 48 inches: Three hinges and two compression latches.
 - 4. Larger Sizes: Furnish additional hinge.
 - 5. Access panels with sheet metal screw fasteners are not acceptable.
- 2.9 FLEXIBLE DUCT CONNECTIONS
- A. Manufacturers: Duro-Dyne or approved equal
 - B. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.
 - C. Double fold "Grip-Loc" metal-to-fabric connection.
 - D. Indoor Connector: "Metal-Fab", 24 ga, 3"metal - 3" fabric - 3" metal.
 - 1. Fabric: UL listed fire-retardant Neoprene coated woven glass fiber fabric conforming to NFPA 90A, minimum density 30 oz per sq yd, 500 lbs tensile strength.

- E. Exterior Connector: "Metal-Fab", 24 ga, 3"metal - 3" fabric - 3" metal.
 - 1. Fabric: UI listed fire-retardant Hypalon coated woven galas fiber fabric conforming to NFPA 90A, minimum density 24 oz per sq yd, 250 lbs tensile strength.

2.10 PRESSURE GAGES

- A. Manufacturers: Dwyer Magnehelic or approved equal.
- B. Dial Gages: 4 inch diameter dial in metal case, diaphragm actuated, black figures on white background, front calibration adjustment, 2 percent of full scale accuracy.
- C. Inclined Manometer: Plastic with red liquid on white background with black figures, front calibration adjustment, 3 percent of full scale accuracy.
- D. Accessories: Static pressure tips with compression fittings for bulkhead mounting, 1/4 inch diameter tubing.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify rated walls are ready for fire damper installation.
- B. Check location of air outlets and inlets and make necessary adjustments in position to conform to architectural features, symmetry, and lighting arrangement.

3.2 INSTALLATION.

- A. Install in accordance with NFPA 90A, and follow SMACNA HVAC Duct Construction Standards - Metal and Flexible. Refer to Section 23 31 00 for duct construction and pressure class.
- B. See Section 23 34 00, paragraph 1.4 for damper installation.
- C. Provide motorized in lieu of gravity back-draft dampers per Energy Code.
- D. Provide control dampers where not furnished with packaged equipment.
- E. Provide insulated control dampers where:
 - 1. The damper is installed behind a louver.
 - 2. The damper is installed in a roof penthouse or gravity ventilator.
 - 3. The damper is unducted and open to a conditioned space.
- F. Provide shroud (matching duct material) over flexible duct connections when installed outside.
- G. Install remote operated dampers for balancing where damper is located in an inaccessible location.
- H. Access Doors: Install access doors at the following locations and as indicated on Drawings:
 - 1. Before and after each fire damper, smoke damper and combination fire and smoke damper.
 - 2. Where access is required for a valve or damper.

3. Install at locations for cleaning kitchen exhaust ductwork in accordance with NFPA 96.
 - I. Access Door Sizes: Install minimum 8 x 8 inch size for hand access, 18 x 18 inch size for shoulder access, and as indicated on Drawings. Review locations prior to fabrication.
 - J. Install temporary duct test holes as required for testing and balancing purposes. Cut or drill in ducts. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.
 - K. Install fire dampers, combination fire and smoke dampers and smoke dampers at locations as indicated on Drawings. Install with required perimeter mounting angles, sleeves, breakaway duct connections, corrosion resistant springs, bearings, bushings and hinges.
 1. Install smoke dampers and combination smoke and fire dampers in accordance with NFPA 92A.
 2. Install dampers square and free from racking with blades running horizontally.
 3. Do not compress or stretch damper frame into duct or opening.
 4. Handle damper using sleeve or frame. Do not lift damper using blades, actuator, or jack shaft.
 5. Install bracing for multiple section assemblies to support assembly weight and to hold against system pressure. Install bracing as needed.
 6. Coordinate fire/smoke damper and smoke damper with Fire Alarm Contractor for smoke detector activation and fire alarm system integration. Install any duct smoke detectors furnished by Fire Alarm Contractor.
- 3.3 INSTALLATION - GAGES
- A. Install static pressure gages to measure across filters and filter banks, (inlet to outlet). On multiple banks, provide manifold and single gage.
 - B. Provide instruments with scale ranges selected according to service with largest appropriate scale.
- 3.4 INSTALLATION - FLEXIBLE DUCT CONNECTIONS
- A. Provide flexible duct connection on supply outlet and return/exhaust inlet of all ducted fan powered equipment.
 - B. Support and align ductwork to avoid strain on flexible connection.
- 3.5 DEMONSTRATION
- A. Demonstrate re-setting of fire dampers to Owner's representative.

END OF SECTION

SECTION 23 34 00 - HVAC FANS

PART 1 **GENERAL**

1.1 SUMMARY

- A. Section Includes:
 - 1. Fans.

1.2 QUALITY ASSURANCE

- A. Performance Ratings: Conform to AMCA 210 and bear AMCA Certified Rating Seal.
- B. Sound Ratings: AMCA 301, tested to AMCA 300, and bear AMCA Certified Sound Rating Seal.
- C. UL Compliance: UL listed and labeled, designed, manufactured, and tested in accordance with UL 705.
- D. Balance Quality: Conform to AMCA 204.

1.3 DAMPERS

- A. A gravity backdraft or motorized control damper is required on every exhaust fan.
- B. Fans which are noted to operate continuously or have a capacity of 300 cfm or less shall have a gravity backdraft damper unless noted otherwise. All other fans shall have a motorized control damper.
- C. See 23 33 00 for motorized control dampers.
- D. Provide insulated control dampers where scheduled or where required by 23 33 00.

PART 2 **PRODUCTS**

2.1 UP-BLAST CENTRIFUGAL TYPE I EXHAUST FANS

- A. Manufacturers: Greenheck, Cook or approved equal. UL 762 Listed.
- B. Construction: Spun aluminum with rigid internal support and welded construction. Backward inclined aluminum wheel and inlet, statically and dynamically balanced. Motor cooling tube and heat baffle insulation.
- C. Belt Drive:
 - 1. Motor: Premium efficiency, heavy duty ball bearing type with steel frame mounted on vibration isolators out of the air stream. Selected operating horsepower to be a maximum of 80% of rated motor horsepower without using safety factor.
 - 2. Bearings: Pillow block type, self-aligning, permanently sealed, lubricated ball bearings, with L-10 life at 100,000 hours.
 - 3. Shafts: Hot rolled steel, ground and polished, with key way.
 - 4. V-Belt Drive: Cast iron or steel sheaves, dynamically balanced, keyed. Variable and adjustable pitch sheaves selected so required rpm is obtained with sheaves

set at mid-position. Matched belts, and drive rated minimum 1.5 times nameplate rating of motor.

- D. Direct Drive:
 - 1. Motor: Electronic Commutation DC brushless motor with internal solid state AC/DC converter circuitry and heavy duty ball bearings. Speed controllable down to 20% of full speed. Minimum 85% efficient at all speeds.
 - a. Motor mounted potentiometer speed control dial.
 - b. [or] 0-10 volt control signal speed input.
- E. Accessories:
 - 1. Insulated roof curb with liner; matched to roof slope.
 - 2. Vented curb extension.
 - 3. Heat baffle
 - 4. High temp curb seal.
 - 5. NEMA disconnect switch.
 - 6. Hinged curb kit with cables.
 - 7. Teflon non-stick wheel coating.
 - 8. Clean out port on windband.
 - 9. Grease trap with drain and absorbent material.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Secure roof fans with cadmium plated steel lag screws to roof curb.
- B. Suspended Fans: Install flexible connections between inlet and outlet of fan and ductwork. Ensure metal bands of connectors are parallel with minimum one inch flex between ductwork and fan while running.
- C. Install safety screen where inlet or outlet is exposed.
- D. Install gravity backdraft or motorized control dampers on discharge of exhaust fans and as indicated on Drawings.
- E. Provide sheaves required for final air balance.

3.2 MANUFACTURER'S FIELD SERVICES

- A. Furnish services of factory trained representative for minimum of one day to start-up, calibrate controls, and instruct Owner on operation and maintenance.

3.3 CLEANING

- A. Vacuum clean inside of fan cabinet.

3.4 DEMONSTRATION

- A. Demonstrate fan operation and maintenance procedures.

3.5 PROTECTION OF FINISHED WORK

- A. Do not operate fans for until ductwork is clean, filters in place, bearings lubricated, and fan has been test run under observation.

END OF SECTION

SECTION 23 37 00 - AIR OUTLETS AND INLETS

PART 1 **GENERAL**

1.1 SUMMARY

- A. Section Includes:
 - 1. Diffusers, Registers & Grilles
 - 2. Louvers

1.2 QUALITY ASSURANCE

- A. Diffuser, register, and grille performance shall be tested and rated in accordance with ASHRAE 70.
- B. Louver performance shall be tested and rated in accordance with AMCA 500.

PART 2 **PRODUCTS**

2.1 RECTANGULAR CEILING DIFFUSER

- A. Manufacturers: Titus, Price, Krueger or approved equal.
- B. Type: Square, stamped, multi-core, adjustable pattern diffuser.
- C. Frame: Surface mount with flat frame or T-bar lay-in.
- D. Fabrication: Steel with baked enamel white finish.
- E. Accessories:
 - 1. Field fabricated steel plenum, internal baffle and round side duct inlet assembly.

2.2 LOW-FLOW RECTANGULAR CEILING DIFFUSER (Outside Air)

- A. Manufacturers: Titus TJD or approved equal.
- B. Type: Square plaque, induction nozzles, removable face panel.
- C. Frame: 24"x24" module for lay-in T-bar ceilings or plaster frame for surface mount GWB ceiling.
- D. Fabrication: Steel with baked enamel white finish.
- E. Accessories:
 - 1. Field fabricated steel plenum, internal baffle and round side duct inlet assembly.

2.3 SUPPLY REGISTER

- A. Manufacturers: Titus, Price, Krueger or approved equal.
- B. Type: Contoured and individually adjustable blades, 3/4" blade spacing, two-way deflection.
- C. Frame: 1-1/4 inch margin with countersunk screw mounting and gasket.

- D. Fabrication: Steel with factory white enamel finish.

2.4 EXHAUST/ RETURN GRILLE

- A. Manufacturers: Titus, Price, Krueger or approved equal.
- B. Type: Fixed blades, 1/2 inch blade spacing, with blades set at 35 degrees.
- C. Frame: 1-1/4 inch margin with countersunk screw mounting, welded corners.
- D. Fabrication: Steel with 20 gage minimum frames and 22 gage minimum blades, with factory white enamel finish.
- E. Accessories:
 - 1. Opposed blade damper.
 - 2. Field fabricated steel plenum, internal baffle and round side duct inlet assembly.

2.5 EGGCRATE EXHAUST / RETURN GRILLE

- A. Manufacturers: Titus, Price, Krueger or approved equal.
- B. Type: Fixed grilles of 1/2 x 1/2 x 1/2 inch aluminum core.
- C. Frame: 1-1/4 inch margin with countersunk screw mounting or channel lay-in frame for suspended grid ceilings.
- D. Fabrication: Aluminum with factory white enamel finish.

2.6 LOUVERS

- A. Manufacturers: Greenheck ESD-403, Ruskin, Wonder Metal or approved equal.
- B. Product Description: Stationary, drainable blade. AMCA certified.
- C. Type: 4 inch deep with blades on 45 degree slope, heavy channel frame. Minimum initial point of water penetration of 900 fpm.
- D. Fabrication: 12 gage thick extruded aluminum, welded assembly, with factory 2-coat 70% Kynar finish, color to be selected.
- E. Mounting: Furnish with flanges, mullions, and hardware for installation.
- F. Bird Screen: Aluminum 3/4" x 0.051" flattened expanded metal.
- G. Inset Screen: Aluminum 16x18 mesh, aluminum frame.

PART 3 **EXECUTION**

3.1 EXAMINATION

- A. Verify inlet and outlet locations with Architectural Plans.
- B. Verify ceiling/wall type before ordering.
- C. Verify diffuser air patterns are as indicated before starting air balance.

3.2 INSTALLATION

- A. Install diffusers to ductwork with airtight connection.
- B. Install balancing dampers on duct take-off to diffusers, grilles, and registers, whether or not dampers are furnished as part of diffuser, grille, and register assembly.
- C. Paint visible portion of ductwork behind air outlets and inlets matte black

3.3 INTERFACE WITH OTHER PRODUCTS

- A. Check location of outlets and inlets and make necessary adjustments in position to conform to architectural features, symmetry, and lighting arrangement.

END OF SECTION

SECTION 23 38 00 - HOODS

PART 1 **GENERAL**

1.1 SUMMARY

- A. Section Includes:
 - 1. Type I Grease Hood

1.2 REQUIREMENTS

- A. The equipment of this section shall be provided by a single vendor.

PART 2 **PRODUCTS**

2.1 TYPE I GREASE HOOD

- A. Manufacturers: Accurex, Greenheck or approved equal.
- B. Kitchen Ventilation hood shall be Type I, wall canopy type. The hood shall be UL 710 Listed without fire damper for 400°F rated cooking appliances.
- C. The hood exterior shall be constructed of a minimum of 18 gauge stainless steel with an embossed finish 430 SS. The hood(s) shall be constructed using the standing seam method for optimum strength. An integral 3 inch air space is provided to meet NFPA 96 clearance requirements against limited combustible walls. All seams, joints and penetrations of the hood enclosure shall be welded and/or liquid tight. All unexposed interior surfaces shall be constructed of a minimum 18 gauge corrosion resistant steel including, but not limited to ducts, plenum, and brackets.
- D. The hood shall include a filter housing constructed of the same material as the hood. The Grease-X-Tractor high efficiency stainless filters shall be UL 1046 Classified and NSF Certified. Filters shall direct the exhaust airflow through individual cyclone chambers, utilizing centrifugal impingement grease extraction technology. The filter housing shall terminate in a pitched, full length grease trough which shall drain into a removable grease container.
- E. The hood shall include a Performance Enhancing Lip (PEL) to improve capture efficiency by turning air back into the hood.
- F. Vapor proof, U. L. Listed incandescent or LED light fixtures shall be pre-wired to a junction box situated at the top of the hood for field connection. Provide quantity of lights necessary to obtain 40 foot-candles on working surface.
- G. Hood shall be built in accordance with National Fire Protection Association (NFPA) Bulletin #96, International Mechanical Code (IMC), and bear the National Sanitation Foundation (NSF) Seal of Approval.
- H. External Supply Plenums: Air Curtain Supply Plenum (ASP) with perforated panels for low velocity air distribution. Full length of hood, 12 to 24 inch width.
 - 1. Internally insulated supply plenum.

2.2 FIRE SUPPRESSION SYSTEM

- A. Manufacturers: Ansul, Amerex or approved equal.
- B. Factory engineered, pre-piped, wet chemical, UL 300 fire suppression system complete with gas valve, detectors, fusible links, release mechanism, tank, fire suppression agent, remote manual pull station, relays and remote mounted fire cabinet.
- C. Schedule 40 black iron pipe. Factory installed piping concealed above hood. Exposed appliance drops shall be chrome. Field piping from hood to remote chemical tank cabinet.
- D. Electric gas solenoid valve with manual reset relay.

2.3 CONTROL

- A. Provide by hood manufacturer.
- B. Temperature Interlock with heat sensor.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with NFPA 96.
- B. Ensure that hood operation is interlocked with cooking appliances by use of heat sensor or gas valve interlock.
- C. Provide 100W equivalent LED bulbs for incandescent fixtures.
- D. Fire suppression system shall be installed by factory certified distributor and include mounting cabinet, connection of detection lines, connection of supply lines, mounting and connection of remote manual pull station and control connection of gas valve. System shall be charged and tagged.

3.2 TESTING

- A. Review exhaust and make-up air test and balance for compliance with scheduled equipment, UL tested minimum airflows and code minimum air flows.
- B. Perform smoke capture and containment test with appliances installed under hood per IMC 507.6.1. Test shall simulate cooking by producing smoke or steam. Provide written report of visual observations.

END OF SECTION

SECTION 23 40 00 - FILTERS

PART 1 **GENERAL**

1.1 SUMMARY

- A. Section Includes:
 - 1. Disposable, pleated filters.
 - 2. Filter frames and housings.
 - 3. Filter gages.

1.2 PERFORMANCE REQUIREMENTS

- A. Conform to ARI 850 Section 7.4.
- B. Dust Spot Efficiency: Plus or minus 5 percent.

PART 2 **PRODUCTS**

2.1 DISPOSABLE, PLEATED FILTERS

- A. Manufacturers: Camfil, Flanders, Airguard, Viledon or approved equal.
- B. MERV 8: UL 900 Class 2, pleated, cotton and polyester blend, radial pleat with welded wire grid, cardboard frame. 1", 2" & 4". (Camfil 30/30)
- C. MERV 13 (85%): UL 900 Class 2, pleated synthetic media with three layers, spunbond polyester prefilter, electrostatically spun polycarbonate microfiber middle layer and spunbond polyester downstream layer. 2" & 4" (Viledon Mini 85)
- D. MERV 13 (85%): UL 900 Class 2, extended surface mini pleated, fiberglass or synthetic media, corrosion-resistant metal frame. 4" (Flanders PrecisionCell II)

2.2 FILTER FRAMES AND HOUSINGS

- A. General: Fabricate filter frames and supporting structures of 16 gage galvanized steel or extruded aluminum T-section construction with necessary gaskets between frames and walls.
- B. Standard Sizes: For interchange ability of filter media of other manufacturers; minimum 2 inches thick; for extended surface and high efficiency particulate air filters, provide for upstream mounting of panel filters.
- C. Side Servicing Housings: Flanged for insertion into ductwork, of reinforced 16 gage galvanized steel; access doors with continuous gaskets and positive locking devices on both sides; extruded aluminum tracks or channels for filters with positive sealing gaskets.

PART 3 **EXECUTION**

3.1 INSTALLATION

- A. Install filters with felt, rubber, or neoprene gaskets to prevent passage of unfiltered air around filters.

- B. Install filter gage static pressure tips upstream and downstream of filters. Mount filter gages on outside of filter housing or filter plenum, in accessible position. Adjust and level.
- C. Do not operate fan system until filters are in place. Replace filters used during construction before testing, with clean set. Provide owner with replacement set of filters.

END OF SECTION

SECTION 23 72 00 - ENERGY RECOVERY UNITS

PART 1 **GENERAL**

1.1 SUMMARY

- A. Section Includes:
 - 1. Package ERV with energy recovery/heating/cooling

1.2 QUALITY ASSURANCE

- A. Entire unit shall be ETL Certified per U.L. 1995 and bear an ETL sticker.
- B. Blowers shall be AMCA Certified for airflow.
- C. Energy Wheel shall be AHRI Certified per Standard 1060.

1.3 COORDINATION

- A. Coordinate size and location of all building penetrations required for installation of each unit and associated hydronic, gas and electrical systems.
- B. Contractor shall coordinate with roofing contractor to ensure curb unit is properly flashed.

1.4 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Filters: 3 sets of disposable filters for each unit.
 - 2. One set of fan and energy wheel belts

1.5 ELECTRICAL

- A. Short-Circuit Current Rating (SCCR): All HVAC and refrigeration equipment with multi-motor or combination electrical loads shall comply with NEC 110.10 & 440.4 and must include a SCCR greater than the Available Interrupting Current (AIC) of the electrical circuit serving the equipment. See electrical drawings for required AIC kA rating. Equipment SCCR may be presented in writing from the manufacturer or shown on the unit nameplate. Refrigeration or air-conditioning equipment over 60 Amps MOCP must list the SCCR on the unit nameplate. If the AIC rating is unavailable or cannot be determined provide equipment with a minimum SCCR of 10kA.

PART 2 **PRODUCTS**

2.1 PACKAGE ROOFTOP VENTILATOR W/ ENERGY RECOVERY/HEATING/COOLING

- A. Manufacturers: Greenheck RVE, Aeon or approved equal.
- B. General: Unit shall be fully assembled at the factory and consist of an insulated metal cabinet, weatherhood outdoor air intake with 2" aluminum mesh filter assembly, energy wheel, electric post-heater, evaporator coil, condensate drain pan, p-trap, packaged DX system, motorized insulated low-leak dampers, sensors, curb assembly, filter assembly for intake air and exhaust air, supply air blower, exhaust air blower, and an electrical

microprocessor control center. All specified components and internal accessories factory installed and tested and prepared for single-point high voltage power connection.

- C. Cabinet: Formed double wall insulated metal cabinet. Outside casing: 18 gauge, galvanized (G60) steel, factory pre-painted with polyester urethane paint (permatector). Internal assemblies: 22 gauge, galvanized steel except for motor supports which shall be minimum 14 gauge galvanized steel. Inner wall of double wall construction shall be minimum 24 gauge galvanized steel.
1. Cabinet Insulation: 2" rigid urethane foam, R-13. Full coverage of entire cabinet exterior to include walls, roof and floor of unit. Insulation shall be installed between inner and outer shells of all cabinet exterior components.
 2. Access panels / doors: Unit shall be equipped with insulated, hinged doors. Doors shall be fabricated of 18 gauge galvanized G90 steel.
 3. Condensate drain pan: Pan shall be formed of welded austenitic stainless steel sheet material and provided with a welded drain connection at the front for connection to a P trap. Drain pan shall be sloped in two directions to provide positive draining. Drain connector shall be sealed at penetration through cabinet.
 4. P trap: An engineered P trap (condensate drain) assembly shall be provided for each unit, to include cleanout ports, cleanout tool, vacuum break device and see-through reservoir.
- D. Energy wheel: Energy wheel shall be of the total enthalpy, rotary air-to-air type and shall be an element of a removable energy wheel cassette. The cassette shall consist of a galvanized steel framework, an energy wheel as specified and a motor and drive assembly. The cassette shall incorporate a pre-tensioned urethane drive belt or link style belt with a five year warranty. The wheel media shall be a polymer film matrix in a stainless steel framework and be comprised of individual segments that are removable for servicing. Non-segmented energy wheels are not acceptable. Silica gel desiccant shall be permanently bonded to the polymer film. The energy wheel is to have a five year warranty.
- E. Supply Air and Exhaust Air Blowers: Blower assembly shall consist of an electric motor and direct-drive fan(s). Assembly shall be mounted onto a 14-gauge galvanized steel rails which are mounted on 1.125 inch neoprene vibration isolators.
1. Shall be statically and dynamically balanced and designed for continuous operation at maximum rated fan speed and horsepower.
 2. Direct drive, airfoil plenum fan with steel wheels.
 3. Blower motor shall be capable of continuous speed modulation and controlled by a VFD.
- F. Motors: Blower motors greater than $\frac{3}{4}$ horsepower shall be "NEMA Premium™" efficiency. Motors shall be heavy-duty, permanently lubricated type to match the fan load and furnished at the specified voltage, phase and enclosure. Motors shall be VFD rated.
- G. Wheel Frost Control: Timed Exhaust – control system shall include an outdoor air thermostat and pressure sensor on the wheel assembly to initiate frost control sequence.
- H. Electric Post-heater: Post-heater shall be SCR control and shall include a temperature sensor with field adjustable set point, located in the supply air stream. Heat output of the post-heater shall be infinitely variable.
- I. Evaporator Coil: Shall be AHRI Certified and shall be (silver) soldered or brazed into the compressed refrigerant system. Coil shall be constructed of copper tubing, permanently bonded to aluminum fins and enclosed in a galvanized steel frame. For two compressors the evaporator coil shall be of "interlaced" configuration, permitting independent operation

of either compressor. The evaporator and condenser coils are coated with ElectroFin® coil coating.

- J. Packaged DX System: Integral compressor(s) and evaporator coil located within the weather-tight unit housing. The evaporator and condenser coils are coated with ElectroFin® coil coating. Condenser coils and appurtenant condenser fan assemblies shall be factory installed as integral subassemblies, mounted on the exterior of the unit.
 - 1. Unit condenser fans shall feature swept blade design resulting in reduced sound levels.
 - 2. Lead condenser fan shall have an electronically commutated (EC) motor that will modulate to maintain a head pressure set point. Other condenser fan motors shall be three phase, external rotor, type 56 frame, open air over and shaft up. Each condenser fan motor shall have a vented frame, rated for continuous duty and be equipped with an automatic reset thermal protector. Motors shall be UL Recognized and CSA Certified.
 - 3. The refrigerant compressor(s) shall be inverter scroll-type and shall be equipped with liquid line filter drier, thermostatic expansion valves (TXV)(s), manual reset high pressure and low pressure cutouts and all appurtenant sensors, service ports and safety devices. System shall be fully charged with R-410A refrigerant. Each compressor shall be factory-equipped with an electric crankcase heater.
- K. Motorized dampers: Exhaust Air and Intake Air AMCA Class 1A motorized dampers of insulated low leakage type shall be factory installed.
- L. Filter Section: Permanent 2" aluminum filters located in the outdoor air intake and shall be accessible from the exterior of the unit. Combination of MERV 8 and MERV 13 pleated filters shall be provided in the intake air stream and MERV 8 filters in the exhaust air stream.
- M. Sensors which are part of various optional operational modes or device controllers and are to be factory supplied and installed.
- N. Curb Assembly: 14-gauge galvanized steel factory curb. The curb assembly shall provide perimeter support of the entire unit and shall have duct adapter(s) for supply air and return air. Contractor shall provide and install appropriate insulation for the curb assembly.
- O. Control panel / connections: Unit shall have an electrical control center where all high and low voltage connections are made. Control center shall be constructed to permit single-point high voltage power supply connection including electric post heater.
 - 1. The unit shall be constructed so that it can function as a stand-alone heating/cooling system controlled by factory-supplied microprocessor programmable controller, thermostats and sensors.
 - 2. Factory controller shall have an LCD screen with text readouts of status and built-in keypad.
 - 3. Variable Frequency Drive (VFD): Unit shall have factory installed variable frequency drives for modulation of the blower motors. The VFDs shall be factory-programmed for unit-specific requirements and shall not require additional field programming to operate.
 - 4. Remote Interface: Contractor shall provide and install a Remote Interface that functions as a remote indicator of owner-selected operating parameters and also permits remote inputting of new operating parameters. Each remote panel shall have a large LCD user interface screen.
 - 5. Sensors:
 - a. Dirty Filter Sensors

- b. Temperature Sensors- OA, SA, RA, EA
 - c. Pressure Sensor- SA, RA
 - d. Rotation Sensor
- P. Accessories:
- 1. Hail guards
 - 2. Seismic vibration isolation curb
 - 3. Modulating energy wheel economizer control with temp/enthalpy sensors

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify roof curbs are installed and dimensions are as instructed by manufacturer.

3.2 PREPARATION

- A. Furnish roof curbs for installation.

3.3 INSTALLATION

- A. Secure unit with cadmium plated steel lag screws to roof curb.
- B. Install flexible connections between unit and ductwork. Ensure metal bands of connectors are parallel with minimum one inch flex between ductwork and fan while running.
- C. Provide sheaves required for final air balance.

3.4 MANUFACTURER'S FIELD SERVICES

- A. Furnish services of factory trained representative for minimum of one day to start-up, calibrate controls, and instruct Owner on operation and maintenance.

3.5 CLEANING

- A. Vacuum clean coils and inside of fan cabinet.
- B. Install clean filters.

3.6 DEMONSTRATION

- A. Demonstrate fan operation and maintenance procedures.

3.7 PROTECTION OF FINISHED WORK

- A. Do not operate fans for until ductwork is clean, filters in place, bearings lubricated, and fan has been test run under observation.

END OF SECTION

SECTION 23 74 00 - OUTDOOR AIR-HANDLING UNITS

PART 1 **GENERAL**

1.1 SUMMARY

- A. Section includes:
 - 1. Packaged rooftop heat pumps.
 - 2. Roof curb.

1.2 QUALITY ASSURANCE

- A. Outside Air Damper Leakage: Test in accordance with AMCA 500.

1.3 ELECTRICAL

- A. Short-Circuit Current Rating (SCCR): All HVAC and refrigeration equipment with multi-motor or combination electrical loads shall comply with NEC 440.4(B) and must include a SCCR greater than the Available Interrupting Current (AIC) of the electrical circuit serving the equipment. See electrical drawings for AIC kA rating. For equipment 60 Amps or less MOCP the SCCR may be presented in writing from the manufacturer or shown on the unit nameplate. Equipment over 60 Amps MOCP must list the SCCR on the unit nameplate. If AIC rating is unavailable or cannot be determined provide a minimum SCCR of 10kA.

PART 2 **PRODUCTS**

2.1 PACKAGED ROOFTOP HEAT PUMP UNITS (3-10 TONS)

- A. Manufacturers: Trane, Carrier, York, Aeon or approved equal.
- B. Product Description: Self-contained, packaged, factory assembled and wired, consisting of roof curb, cabinet, supply fan, refrigerant cooling coil, compressor, reversing valve, refrigeration circuit, condenser, electric heating coils, air filters, mixed air casing, microprocessor controls, R-410A refrigerant charge and accessories. ARI tested, UL listed.
- C. Configuration: Convertible Downflow or Horizontal air delivery.
- D. Roof Mounting Curb: Galvanized steel, channel frame with gaskets, nailer strips. Full perimeter type for mounting under entire unit, shipped knocked down for field assembly.
- E. Cabinet: Heavy gauge, galvanized steel with baked enamel finish, tested for 1000 hours ASTM B117 salt spray test, removable or hinged access panels, 1/2 inch foil-faced insulation with sealed edges.
- F. Supply Fan: Forward curved centrifugal type, resiliently mounted with V-belt drive, adjustable variable pitch motor pulley, high efficiency motor. Motor permanently lubricated with built-in thermal overload protection.
- G. Evaporator Coil: Constructed of copper tubes expanded onto aluminum fins. Double slope drain pan with piping connection. Factory leak tested to 200 psi.

- H. Compressor: Direct drive, hermetic, scroll with centrifugal oil pump, suction gas cooled, internal overload protection.
- I. Refrigeration circuit: Thermal expansion valve, filter-drier, suction, discharge, and liquid line service valves with gauge ports. Dehydrate and factory charge with oil and refrigerant.
- J. Condenser:
 - 1. Coil: Constructed of copper tubes expanded onto aluminum fins. Factory leak tested to 200 psi.
 - 2. Condenser Fan: Direct drive propeller fans statically and dynamically balanced. Motor permanently lubricated with built-in thermal overload protection.
- K. Air Filters: 2 inch pleated, MERV 8.
- L. Mixed Air Casing:
 - 1. Outside Air Damper Leakage: Class 1A, maximum 3.0 cfm per square foot at 1.0 inches wg pressure differential.
 - 2. Economizer: Factory installed fully modulating motorized outside air and return air dampers controlled by dry bulb controller with minimum position setting. Outside air damper normally closed and return air damper normally open. Furnish barometric relief damper capable of closing by gravity. Furnish rain hood with screen.
- M. Economizer: 100% outside air integrated economizer control capable of additional mechanical cooling during economizer. Fault detection and diagnostics (FDD) shall be permanently installed to monitor system operation according to the Washington State Energy Code.
- N. Microprocessor Based Controls:
 - 1. Factory mounted with the following features:
 - a. Monitor each mode of operation.
 - b. Evaporator fan status.
 - c. Filter status.
 - d. Indoor air quality.
 - e. Supply air temperature.
 - f. Outdoor air temperature.
 - 2. Diagnostics for thermostat commands for staged heating, staged cooling, fan operation, and economizer operation.
 - 3. Zone space temperature sensor to interface with microprocessor controls with automatic programmable night setback.
- O. Accessories:
 - 1. Powered convenience outlet, 115 volt, 15 amp, GFCI type.
 - 2. Through the base electrical and gas
 - 3. Thermal expansion valve
 - 4. Hot gas bypass
 - 5. [Belt drive motor]
 - 6. Hinged access doors
 - 7. [Differential enthalpy economizer control]
 - 8. Multi-stage heating and cooling
 - 9. Emergency heat control
 - 10. Low ambient control

2.2 SOURCE QUALITY CONTROL

- A. Perform factory test of each unit. Test includes:
 - 1. Dynamic trim balance of completed fan assembly.
 - 2. Complete run check of electrical components and safety controls, including control sequencing.
 - 3. Pressure test, at manufacturer's rated pressure, of refrigerant coils and condenser coils prior to unit assembly.
 - 4. Leak check of completed refrigerant circuits.
 - 5. Leak check of completed water circuit.
 - 6. Compressor run check.

PART 3 **EXECUTION**

3.1 EXAMINATION

- A. Verify roof curbs are installed and dimensions are as shown on shop drawings.
- B. Verify piping rough-in is at correct location.
- C. Verify electrical rough-in is at correct location.

3.2 PREPARATION

- A. Furnish roof curbs for installation.

3.3 INSTALLATION

- A. Install in accordance with ARI 430.
- B. Roof Curb:
 - 1. Assemble roof curb.
 - 2. Install roof curb level.
 - 3. Coordinate curb installation and flashing.
 - 4. Install units on roof curb providing watertight enclosure to protect ductwork and utility services.
 - 5. Install gasket material between unit base and roof curb.
- C. Install flexible connections between unit and inlet and discharge ductwork. Install metal bands of connectors parallel with minimum 1 inch flex between ductwork and fan while running.
- D. Install assembled units with vibration isolators. Install isolated fans with resilient mountings and flexible electrical leads.
- E. Install condensate piping with trap and route from drain pan to splash block on roof.
- F. Provide fixed sheaves required for final air balance.
- G. Insulate coil headers located outside airflow as specified for piping.
- H. Install components furnished loose for field mounting.
- I. Install electrical devices furnished loose for field mounting.

- J. Install control wiring between unit and field installed accessories.

3.4 INSTALLATION REFRIGERANT COILS

- A. Install sight glass in liquid line within 12 inches of coil.
- B. Install piping specialties.

3.5 MANUFACTURER'S FIELD SERVICES

- A. Furnish initial start-up and shutdown during first year of operation, including routine servicing and checkout.
- B. Furnish services of factory trained representative for minimum of one day to leak test, refrigerant pressure test, evacuate, dehydrate, charge, start-up, calibrate controls, and instruct Owner on operation and maintenance.

3.6 CLEANING

- A. Vacuum clean coils and inside of unit cabinet.
- B. Install temporary filters during construction period. Replace with permanent filters at Substantial Completion.
- C. After construction is completed, including painting, clean exposed surfaces of units.
- D. Touch up marred or scratched surfaces of factory finished cabinets, using finish materials furnished by manufacturer.

3.7 DEMONSTRATION

- A. Demonstrate unit operation and maintenance.

3.8 PROTECTION OF FINISHED WORK

- A. Do not operate units until ductwork is clean, filters are in place, bearings lubricated, and fan has been test run under observation.
- B. Protect finished surfaces of cabinets with protective covers during remainder of construction.

END OF SECTION

SECTION 23 74 23 - OUTDOOR MAKEUP AIR-HANDLING UNITS

PART 1 **GENERAL**

1.1 SUMMARY

- A. Section includes:
 - 1. Makeup air handling units

1.2 QUALITY ASSURANCE

- A. Outside Air Damper Leakage: Test in accordance with AMCA 500.

1.3 ELECTRICAL

- A. Short-Circuit Current Rating (SCCR): All HVAC and refrigeration equipment with multi-motor or combination electrical loads shall comply with NEC 440.4(B) and must include a SCCR greater than the Available Interrupting Current (AIC) of the electrical circuit serving the equipment. See electrical drawings for AIC kA rating. For equipment 60 Amps or less MOCP the SCCR may be presented in writing from the manufacturer or shown on the unit nameplate. Equipment over 60 Amps MOCP must list the SCCR on the unit nameplate. If AIC rating is unavailable or cannot be determined provide a minimum SCCR of 10kA.

PART 2 **PRODUCTS**

2.1 MAKEUP AIR HANDLING UNITS

- A. Manufacturers: Greenheck, Reznor or approved equal.
- B. General: Packaged makeup air unit consisting of insulated cabinet, fan, furnace, filters, motor, controls and accessories as indicated below. All components by the same manufacturer with AMCA rating and UL approved.
- C. Fans: Centrifugal fan double width, double inlet, statically and dynamically balanced. Mounted on a common base with motor; spring isolated. Steel fan shafts shall be mounted in permanently lubricated ball bearings with L10 life of 100,000 hours at maximum speed.
- D. Motors and Drives: Heavy duty, EPACT, permanently lubricated. Cast pulleys with machined surface. Drive shall be sized for a minimum of 150% of driven horsepower.
- E. Unit Casing: Double wall insulated with internal frame type construction of galvanized steel. Powder coated paint. All components shall be easily accessible through removable doors.
- F. Furnace: Indirect gas fired, 80% efficient with a 4:1 turn down ratio, stainless steel heat exchanger, power venting system, gas pressure regulator, gas valve, electronic modulating controls, direct spark ignition system, high limit and a 24 volt control transformer. Insulated double wall construction.
- G. Intake: Weatherhood, galvanized steel with birdscreen, aluminum mesh filters and low leak damper with motorized actuator.

- H. Filters: 2" pleated, MERV 8 mounted in a V-bank arrangement; accessible through a removable access panel.
- I. Controls: Remote industrial control panel with HOA switches for fan and heat, indicator lights for fan, heat and dirty filter, and room override thermostat.
 - 1. Duct supply temperature control for furnace staging.
- J. Electrical: All internal electrical components shall be prewired for single point power connection. All electrical components shall be UL listed. Control center shall include motor starter, control circuit fusing, control transformer for 120 VAC circuit, integral disconnect switch with separate motor fusing and terminal strip.
- K. Accessories:
 - 1. Filter gauge with dirty filter light
 - 2. Discharge temperature control
 - 3. Freezestat
 - 4. Neoprene / Spring blower isolation
 - 5. 5 year heat exchanger warranty
 - 6. Insulated roof curb with duct adapter

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify roof curbs are installed and dimensions are as shown on shop drawings.
- B. Verify gas piping rough-in is at correct location.
- C. Verify electrical rough-in is at correct location.

3.2 PREPARATION

- A. Furnish roof curbs and vibration isolation for installation.

3.3 INSTALLATION

- A. Install in accordance with ARI 430.
- B. Roof Curb:
 - 1. Assemble roof curb.
 - 2. Install roof curb level.
 - 3. Coordinate curb installation and flashing.
 - 4. Install units on roof curb providing watertight enclosure to protect ductwork and utility services.
 - 5. Install gasket material between unit base and roof curb.
- C. Install flexible connections between unit and inlet and discharge ductwork. Install metal bands of connectors parallel with minimum 1 inch flex between ductwork and fan while running.
- D. Install assembled units with vibration isolators. Install isolated fans with resilient mountings and flexible electrical leads.
- E. Provide fixed sheaves required for final air balance.

- F. Install components furnished loose for field mounting.
- G. Install electrical devices furnished loose for field mounting.
- H. Install control wiring between unit and field installed accessories.

3.4 MANUFACTURER'S FIELD SERVICES

- A. Furnish initial start-up and shutdown during first year of operation, including routine servicing and checkout.
- B. Furnish services of factory trained representative for minimum of one day to leak test, refrigerant pressure test, evacuate, dehydrate, charge, start-up, calibrate controls, and instruct Owner on operation and maintenance.

3.5 CLEANING

- A. Vacuum clean coils and inside of unit cabinet.
- B. Install temporary filters during construction period. Replace with permanent filters at Substantial Completion.
- C. After construction is completed, including painting, clean exposed surfaces of units.
- D. Touch up marred or scratched surfaces of factory finished cabinets, using finish materials furnished by manufacturer.

3.6 DEMONSTRATION

- A. Demonstrate unit operation and maintenance.

3.7 PROTECTION OF FINISHED WORK

- A. Do not operate units until ductwork is clean, filters are in place, bearings lubricated, and fan has been test run under observation.
- B. Protect finished surfaces of cabinets with protective covers during remainder of construction.

END OF SECTION

SECTION 23 81 43 - AIR-COOLED, VARIABLE REFRIGERANT FLOW, MULTI-UNIT HEAT PUMP

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Outdoor unit
 - 2. Indoor units
 - 3. Digital Controls
 - 4. Condensate Overflow Switch

1.2 MAINTENANCE SERVICE

- A. Furnish service and maintenance of equipment for one year from Date of Substantial Completion. Include maintenance items as shown in manufacturer's operating and maintenance data, including filter replacements, fan belt replacement, and controls checkout and adjustments.
- B. Furnish 24-hour emergency service on breakdowns and malfunctions for this maintenance period.

1.3 QUALITY ASSURANCE

- A. Capacity rating in accordance with ARI.
- B. Sound rating is accordance with ARI 270.
- C. Insulation and adhesives: Meet requirements of NFPA 90A.

1.4 ELECTRICAL

- A. Short-Circuit Current Rating (SCCR): All HVAC and refrigeration equipment with multi-motor or combination electrical loads shall comply with NEC 110.10 & 440.4 and must include a SCCR greater than the Available Interrupting Current (AIC) of the electrical circuit serving the equipment. See electrical drawings for required AIC kA rating. Equipment SCCR may be presented in writing from the manufacturer or shown on the unit nameplate. Refrigeration or air-conditioning equipment over 60 Amps MOCP must list the SCCR on the unit nameplate. If the AIC rating is unavailable or cannot be determined provide equipment with a minimum SCCR of 10kA.

1.5 QUALIFICATIONS

- A. The system shall be installed by a Trane-Mitsubishi authorized CITY MULTI Diamond Dealer. The contractor service and install training should be performed by the manufacturer.

1.6 WARRANTY

- A. System shall obtain Diamond ten (10) year extended warranty.
- B. Warranties periods shall be from date of substantial completion.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Trane-Mitsubishi CITY MULTI or approved equal.

2.2 OUTDOOR CONDENSING UNIT (3 TO 5 TONS)

- A. Manufacturers: Mitsubishi or approved equal.
- B. General: Variable capacity, heat pump system capable of single or multiple zones.
- C. Units shall be equipped with multiple circuit boards that interface to the control system and shall perform all functions necessary for operation, be completely factory assembled, piped and wired. Each unit shall be run tested at the factory.
 - 1. Sound pressure rating no higher than 59 dB(A).
 - 2. All refrigerant lines shall be individually insulated.
 - 3. Accumulator with refrigerant level sensors and controls.
 - 4. High pressure safety switch, over-current protection and DC bus protection.
 - 5. Capable of operating in heating down to -13°F ambient temperature without additional low ambient controls.
 - 6. High efficiency oil separator plus additional logic controls to ensure adequate oil volume in the compressor is maintained.
- D. Unit Cabinet: The casing shall be fabricated of galvanized steel, bonderized and finished with powder coated baked enamel.
- E. Fan: Direct drive, variable speed propeller type fan with inherent protection, permanently lubricated bearings, mounted for quiet operation, raised guard and horizontal discharge airflow.
- F. Refrigerant: R410A refrigerant is required.
- G. Coil: Nonferrous construction with lanced or corrugated plate fins on copper tubing with an integral metal guard. Fins shall have corrosion resistant blue-fin finish.
- H. Compressor: High performance, inverter driven, modulating capacity scroll compressor with a factory mounted crankcase heater, an inverter to modulate capacity, internal thermal overload, mounted to avoid the transmission of vibration.
- I. Electrical: The unit shall be controlled by integral microprocessors with the control circuit between the indoor units and the outdoor unit being 24VDC completed using a 2-conductor, twisted pair shielded cable to provide total integration of the system.

2.3 TPLFY INDOOR UNIT (4-way Cassette)

- A. General: A cassette style indoor unit that recesses into the ceiling with a ceiling grille and a modulating linear expansion device.
- B. Indoor Unit: Factory assembled, wired and run tested with all factory wiring, piping, electronic modulating linear expansion device, control circuit board, fan motor, self-diagnostic function, 3-minute time delay mechanism, an auto restart function, an emergency operation function and a test run switch. Indoor unit and refrigerant pipes shall be charged with dehydrated air before shipment from the factory.

- C. Unit Cabinet: Ceiling-recessed cassette with provisions for a field installed filtered outside air intake. Branch ducting shall be allowed from cabinet. Four-way grille shall be fixed to bottom of cabinet allowing two, three or four-way blow. Grille vane angles shall be individually adjustable from the controller to customize the airflow pattern for the conditioned space.
- D. Fan: An assembly with a turbo fan direct driven by a single motor. Statically and dynamically balanced to run on a motor with permanently lubricated bearings. Four (4) fan speeds, two of which may be selected by the room controller. Adjustable air outlet system offering 4-way airflow, 3-way airflow, or 2-way airflow. Auto air swing vanes shall be capable of automatically swinging up and down for uniform air distribution.
- E. Filter: Factory installed MERV 4.
- F. Coil: Nonferrous construction with smooth plate fins on copper tubing, inner grooves for high efficiency heat exchange, phos-copper or silver alloy brazed joints, pressure tested at the factory. A condensate pan and drain shall be provided under the coil. Both refrigerant lines to the PLFY indoor units shall be insulated.
- G. Controls: Unit controls to be provided with unit as part of VFRZ system to perform functions necessary to operate the system.
- H. Accessories:
 - 1. Factory installed condensate lift pump.

2.4 TRIM PANEL

- A. Manufacturer: Trane-Mitsubishi PLFY-ITP1, PLFY-ITP2 or PMFY-ITP1
- B. Ceiling cassette trim panel to adapt with t-bar ceilings. High performance ABS impact resistant polymer with a smooth white finish. Black finish optional.

2.5 REFRIGERANT PIPING SERVICE VALVE

- A. Manufacturer: Diamondback or approved equal.
- B. Full port, forged brass ball valve with Schrader valve, flare connections, Teflon seals and gaskets. 700 psig rated, R-410A compatible, fully factory assembled and pressure tested.
- C. Provide with insulation cover of polyethylene foam with PVC cover and tape.

2.6 CONTROLS

- A. General: The physical controllers shall be plastic material with a neutral color. Each remote controller, at a minimum, shall have a LCD (Liquid Crystal Display) that shows room temperature, set point, and fan speed.
- B. Electrical:
 - 1. The electrical voltage from each circuit board to the controls shall be 12 volts DC.
 - 2. Control wiring shall be installed in a daisy chain configuration from indoor unit to indoor unit then to the BC controller and outdoor unit. Control wiring shall run from the indoor unit terminal block to the controller associated with that unit.
 - 3. Wiring shall be 2-conductor 16 AWG or 18 AWG stranded wire with a shield, as defined by control drawing.

2.7 CITY MULTI Controls Network (CMCN)

- A. The CITY MULTI Controls Network (CMCN) consists of remote controllers, centralized controllers, and integrated system software communicating over a high-speed communication bus with optional interconnection and control via a BMS interface using either LonWorks® or BACnet interfaces. The CMCN shall support operation monitoring, scheduling, error e-mail distribution, personal browsers, tenant billing and maintenance support.

2.8 REMOTE CONTROLLERS

- A. Remote controllers shall operate indoor units. The wiring for the remote controllers shall be simple, non-polar, two-wire connections. All remote controllers shall be wall-mounted with an LCD display and contain a microprocessor that constantly monitors operation to maintain smooth indoor unit operation. Set temperature shall be adjusted in increments of 1°F or 2°F, depending on the systems and controllers. In the event of an abnormality, the remote controller shall display a four-digit error code and the indoor unit address.
- B. TAR-U01MEDU-J: Smart ME Remote Controller
1. Backlit touch screen.
 2. Capable of controlling up to 16 indoor units (defined as 1 group).
 3. Displays: Room temperature, relative humidity, operation status, setpoint.
 4. Control the following operations: On/Off, Operation Mode (cool, heat, auto, dry, and fan), temperature setting, fan speed setting, setback, hold and airflow direction setting.
 5. Timer settings of on/off/temperature up to 8 times in a day in 5-minute increments with an Auto Off timer and able to limit the set temperature range.
 6. Room temperature shall be sensed at the Controller.
- C. TAR-40MAA: Deluxe MA Remote Controller
1. Backlit display
 2. Capable of controlling up to 16 indoor units (defined as 1 group).
 3. Displays: Room temperature, relative humidity, operation status, setpoint.
 4. Control the following operations: On/Off, Operation Mode (cool, heat, auto, dry, and fan), temperature setting, fan speed setting, setback, hold and airflow direction setting.
 5. Timer settings of on/off/temperature up to 8 times in a day in 5-minute increments with an Auto Off timer and able to limit the set temperature range.
 6. Room temperature shall be sensed at the Controller.
- D. TAC-YT53: Simple MA Remote Controller
1. Capable of controlling up to 16 indoor units (defined as 1 group).
 2. Allow the user to change on/off, temperature setting, and fan speed setting.
 3. The room temperature shall be sensed at either the Simple MA Remote Controller or the Indoor Unit dependent on the dipswitch setting.
 4. Controller requires no addressing, connected using two-wire, stranded, non-polar control wire to TB15 connection terminal on the indoor unit. Requires cross-over wiring for grouping across indoor units.

2.9 CMCN: System Controllers

- A. TE-200 Centralized Controller
1. Standalone controller shall be capable of controlling up to 50 indoor units across multiple outdoor units. Controller shall be capable of controlling up to 200 indoor

- units across multiple outdoor unit with expansion of up to three AE-50A controllers.
2. Power shall be provided by integrated power supply.
3. Controller shall support operation superseding that of the remote controllers, system configuration, daily/weekly scheduling, monitoring of operation status, night setback setting, free contact interlock configuration and malfunction monitoring.
4. Controller shall have five basic operation controls which can be applied to an individual indoor unit, a group of indoor units, or all indoor units. These controls shall include on/off, operation mode selection (cool, heat, auto, dry, setback and fan), temperature setting, fan speed setting, and airflow direction setting.
5. Ability to enable or disable operation of local remote controllers.
6. Allow both daily and weekly schedules with operations consisting of ON/OFF, mode selection, temperature setting, air flow (vane) direction, fan speed and permit/prohibit of remote controllers.
7. Controller shall be equipped with a RJ-45 Ethernet port to support interconnection with a network PC via a closed/direct Local Area Network (LAN), via an Ethernet Hub on a LAN.
8. 9" high resolution, back lit, color touch panel interface for direct graphical interface and control of system.
9. Memory back up via USB port.
10. Software functions shall be available so that the building manager can securely log into each AE-200 via the PC's web browser to support operation monitoring, scheduling, error e-mail, personal browser, and maintenance diagnostics.

B. Digital Input Digital Output (DIDO) Control Board

1. 2 digital inputs (DI) and 2 digital outputs (DO)
2. (DI) Provide status or fault monitoring.
3. (DO) Provide on/off, start/stop, enable/disable control to external equipment.
4. Interlock M-NET devices or output contacts according to input status.
5. Provide 24 VDC power.

2.10 CMCN: System Integration

- A. The CMCN shall support integration with Building Management Systems (BMS) via our LonWorks® or BACnet interfaces.
- B. LMAP03U: LonWorks® Interface: The Mitsubishi Electric HVAC LonWorks® interface, LMAP03U, shall support up to fifty indoor units with a variety of network variables on a per indoor unit basis. Input variables include, but are not limited to, on/off, operation mode, fan speed, prohibit remote controller, and filter sign reset. Output variables include, but are not limited to, model size, alarm state, error code, and error address.
- C. BAC-HD150: BACnet Interface: The Mitsubishi BACnet® interface, BAC-HD150, shall be compliant with BACnet® Protocol (ANSI/ASHRAE 135-2004) and be Certified by the (BTL) BACnet® Testing Laboratories. The BACnet® interface shall support BACnet Broadcast Management (BBMD). The BACnet® interface shall support a maximum of 50 indoor units. Operation and monitoring points include, but are not limited to, on/off, operation mode, fan speed, prohibit remote controller, filter sign reset, alarm state, error code, and error address.

2.11 CONDENSATE PUMPS

- A. See Section 230500.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Coordinate size and location of concrete pad for condensing unit. Provide inserts for mounting.
- B. Coordinate size and location of sleeves or block-outs needs for refrigerant piping.
- C. Determine refrigerant pipe routing to efficiently minimum run length and avoid interference.

3.2 INSTALLATION

- A. Install condensate piping with trap and determine route from drain pan to nearest waste with 1/4" slope. Provide condensate pump where drain is not available or slope cannot be made.
- B. Install components furnished loose for field mounting.
- C. Install condensing units at grade on concrete foundations with anchors.
- D. Install refrigerant piping from condensing unit(s) to branch controller(s) and from branch controller(s) to indoor units. Install refrigerant specialties furnished with unit.
- E. Insulate both liquid and vapor refrigerant piping on all runs.
- F. Evacuate refrigerant piping and install initial charge of refrigerant.
- G. Install electrical devices furnished loose for field mounting.
- H. Install control wiring between air handling unit, condensing unit, and field installed accessories.

3.3 INSTALLATION – CONTROLS

- A. Set control of equipment based on room controller space temperature rather than default return air temperature.
- B. Setup Ethernet access via local area network. Coordinate setup for remote access with IT.
- C. Setup output of error message notification via email, coordinate with owner for address.
- D. Designate Fan Coils with unit tag and room/space name.
- E. Setup occupied and unoccupied space temperature schedules with 2 hour interval occupied sweep and second unoccupied temperature sweep. Coordinate schedules with Owner.
- F. Provide graphical floor plans for central controller display. Show locations of fan coils on plan with equipment tag.

3.4 INSTALLATION - CONDENSATE PUMPS

- A. See Section 230500.

3.5 MANUFACTURER'S FIELD SERVICES

- A. Furnish initial start-up and commissioning. During first year of operation, including routine servicing and checkout.

3.6 CLEANING

- A. Vacuum clean coils and inside of unit cabinet.
- B. Install new filters in indoor units at Substantial Completion.

3.7 DEMONSTRATION

- A. Demonstrate system operation and maintenance.
- B. Furnish services of manufacturer's technical representative for one day to instruct Owner's personnel in operation and maintenance of units. Schedule training with Owner, provide at least 7 days' notice to Architect/Engineer of training date.

3.8 PROTECTION OF FINISHED WORK

- A. Do not operate indoor units during construction for temporary heat.
- B. Do not operate indoor units until ductwork and room is clean, filters are in place, bearings lubricated, and fan has been test run under observation.

END OF SECTION

SECTION 23 83 23 - ELECTRIC TERMINAL HEATING UNITS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Electric wall heaters.

PART 2 PRODUCTS

2.1 FORCED AIR WALL HEATER (Tamperproof)

- A. Manufacturers: Markel, King, or approved equal.
- B. Heavy gauge housing and frame with sealed tubular heating element, thermal overload cut-off, fan delay switch, built-in tamperproof thermostat, vane axial blower. UL listed.

PART 3 EXECUTION

3.1 EXAMINATION

- A. For recessed units, verify recess dimensions are correct size.
- B. Verify wall construction is ready for installation.
- C. Verify concealed blocking and supports are in place.

3.2 INSTALLATION

- A. Install equipment exposed to finished areas after walls and ceilings are finished and painted. Avoid damage.
- B. Protection: Install finished cabinet units with protective covers during remainder of construction.
- C. Unit Heaters: Hang from building structure, provide seismic bracing. Mount as high as possible to maintain greatest headroom unless otherwise indicated.
- D. Install electric heating equipment including devices furnished by manufacturer but not factory-mounted. Furnish copy of manufacturer's wiring diagram submittal. Install electrical wiring in accordance with manufacturer's submittals.

3.3 CLEANING

- A. After construction is completed, including painting, clean exposed surfaces of units.
- B. Touch-up marred or scratched surfaces of factory-finished cabinets, using finish materials furnished by manufacturer.

END OF SECTION

SECTION 260500 - ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 APPLICABLE PROVISIONS

- A. The General Conditions, Supplementary General Conditions and Division 1 Specification Sections apply to this and all applicable portions of the Special Conditions are hereby made part of this Division.

1.2 SCOPE OF WORK

- A. Scope of Work shall consist of, but not limited to the following:
 - 1. Demolition of electrical equipment in areas of new construction.
 - 2. Branch circuitry, panelboards and circuit breakers for lighting and power for new and remodeled spaces.
 - 3. Branch circuit conduit, boxes, wiring and wiring devices.
 - 4. Construction power facilities.
 - 5. Lighting fixtures including exit and emergency fixtures complete with lamps.
 - 6. Interior and exterior lighting controls.
 - 7. Generator backup system.
 - 8. Telephone / Data raceways, outlet boxes.
 - 9. New fire detection and alarm system.
 - 10. New entry access / security system.
 - 11. Power wiring, magnetic motor starters and disconnects for all equipment requiring them provided under Division 15000 and all other Divisions of these specifications and by the Owner.
 - 12. All other electrical equipment and services needed to complete a usable and operable facility in accordance with all pertinent codes and regulations.

1.3 CODES, STANDARDS AND PERMITS

- A. All work shall conform to the latest edition of the National Electrical Code, City of Port Orchard Electrical Code, State of Washington Electrical Construction Code, Kitsap County Building Code, International Building Code (IBC), 2018 State of Washington Energy Code, State of Washington Administrative Code, National Fire Protection Administration Code, Americans with Disabilities Act (ADA) and all local electrical and fire codes and ordinances.
- B. Obtain and pay for all required licenses, permits and inspections.
- C. All equipment, materials and devices shall bear the Underwriter's Laboratories (UL) label. If no label is available, the label of a testing agency approved by the local inspecting authority is required.
- D. Certification of compliance with codes shall be obtained for Electrical Inspector and shall be submitted to the Owner at completion of work.

1.4 QUALITY ASSURANCE

- A. All new equipment, materials and devices shall be free from defects. Protect all electrical equipment from damage throughout the course of construction.
- B. For the actual fabrication, installation and testing of the work of this section, use only thoroughly trained and experienced personnel who are completely familiar with the requirements for this work and with the installation recommendations of the manufacturers of the specified items.

1.5 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect electrical system materials before, during and after installation and to protect the installed work and materials of all other trades.
- B. Replacement: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect at no additional costs to the Owner.

1.6 FIELD INVESTIGATION

- A. Contractor shall thoroughly investigate site prior to bidding. No change in contract price will be allowed for work required to comply with existing conditions.

1.7 SUBMITTAL INFORMATION - SHOP DRAWINGS

- A. Manufacturers: Submit complete descriptive literature and shop drawings to Architect with bid proposal. No equipment is to be ordered or installed until equipment has been approved without prior written approval from Owner.
- B. Submittal information: Shop drawings are required for the following items: Lighting fixtures, poles and lighting control devices; panelboards and circuit breakers; disconnect switches; meter and panel exterior cabinet; power pedestal; generator and transfer switch; wiring devices and trim plates; Fire Alarm equipment and devices.

1.8 MAINTENANCE MANUAL

- A. Provide maintenance manual for the servicing of all equipment installed. Manuals shall have a typewritten index and divider sheets between categories with identifying tabs.
- B. Data incorporated into manuals shall be neat, clean copies, 8½" x 11" sizes for binding.
- C. Manual shall contain shop drawings, wiring diagrams, operating and maintenance instructions, replacement parts lists and equipment nameplate data for all equipment and systems installed under the project. Provide names, addresses and telephone numbers of manufacturers' representatives.
- D. Three bound copies shall be delivered to the Architect.

1.9 TESTS

- A. The Contractor shall perform all tests required by these specifications. The Contractor shall notify the Architect and Owner at least 48 hours prior to conducting any required tests.

- B. All wiring shall test free from short circuits and ground faults, shall show insulation resistance between phase conductors and neutral and grounding conductors of not less than the rated insulation resistance value of the specific conductors. The system ground, service entrance conductors and all feeders and sub-feeders shall be tested with appropriate meggers, or other approved instruments and methods, to determine ground insulation resistance values.
- C. Contractor shall repair or replace any items failing to meet the requirements at no additional expense to the Owner until such item or items can be demonstrated to comply.
- D. The Contractor shall have available instruments for measuring light intensities, voltage and current levels and for the demonstration of continuity, grounds or open circuit conditions.
- E. Panel loads shall be tested and balanced as closely as possible among all phases. Upon completion of the electrical systems with all electrical equipment connected and operational, take reading of voltage and amperage at main service equipment and at each panelboard and at end of longest branch circuit run at no load and at full load conditions. Record results in tabulated, typed format and include in Operations Manual.

1.10 COORDINATION

- A. The Contractor shall coordinate work among all the various trades doing work in the building and shall examine all drawings, including the Mechanical, Structural and Architectural, for construction details and necessary work coordination.
- B. The Contractor shall coordinate all work and installation requirements with serving utility companies. Conform to all construction requirements as defined by authority having jurisdiction.
- C. Special attention is called to the coordination of door swings and location of all related switches to be on the strike side of the door, and the location of ducts, grilles, pipes and other equipment so that all electrical outlets, lighting fixtures, appliances and other electrical equipment is clear from and in proper relation to these items.
- D. The Contractor will not be paid for cutting, patching, wiring and finishing required for relocation of work installed due to interference with work of other trades.
- E. Contractor shall consult the architectural drawings for the exact height of all outlets with relationship to millwork, trim details and structural elements.

1.11 CLEAN UP

- A. Upon completion of work, and before final acceptance and payment, the Contractor shall, at his expense, remove from the site and adjoining properties and dispose of all surplus and discarded materials, rubbish, temporary buildings, equipment and debris which may have accumulated during the course of work.
- B. All fixtures, equipment and devices shall be thoroughly cleaned and in proper condition prior to final acceptance.

1.12 GUARANTEE

- A. The Contractor shall be responsible for all work put in under this specification and drawings. He shall make good, repair or replace, at his own expense, as may be necessary, any defective work, materials or parts which may show itself within one year after certificate of occupancy, two years for ballasts with installation due to imperfection in materials or workmanship. Incandescent lamps shall not be guaranteed, however, all incandescent lamps shall be operational at the time of final acceptance of the project.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable manufacturers of certain equipment and materials are specified in other sections of this specification.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas for conditions under which work is to be performed. Report to Architect in writing all conditions that will adversely affect satisfactory execution of work. Do not proceed with work until unsatisfactory conditions have been corrected.
- B. Starting of work constitutes acceptance of the conditions under which work is to be performed and this contractor shall, at his expense, be responsible for correcting all unsatisfactory and defective work encountered.

3.2 PREPARATION

- A. Where the work will be installed in close proximity to, or will interfere with work of other trades, assist in working out space conditions to make a satisfactory adjustment. If so directed by Architect, prepare composite working drawings and sections at a suitable scale not less than $\frac{1}{8}'' = 1'-0''$. Clearly showing how work is to be installed in relation to the work of other trades.
- B. Furnish to other trades, as required, all necessary plans, details, drawings or information for the proper installation of work and for the purpose of coordination adjacent work.

3.3 SURVEYS AND MEASUREMENTS

- A. The Contractor shall base all measurements, both horizontal and vertical, from established bench marks. All work shall agree with these established lines and levels. Verify all measurements at site and check the correctness of same as it related to the work.
- B. Any discovery of discrepancy between actual measurements and those indicated shall be brought to the attention of the Architect. Related work shall not proceed until receiving instructions from the Architect.

3.4 INSTALLATION

- A. All wiring shall be provided under Division 16 including wiring for equipment as described under Division 15, and wiring as specified in other Divisions for appliances, heat tape and miscellaneous equipment.
- B. The Division responsible for furnishing the equipment to be controlled shall furnish all control devices and related control wiring required for the equipment to perform, regardless of whether the device is to be wired in a control or power circuit.
- C. All power wiring complete from power source to motor or equipment junction box, including power wiring through starters, shall be furnished and installed under Division 16.

END OF SECTION

SECTION 260519 - 600 VOLT WIRE AND CABLE

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Conform to the requirements of Division 00 and 01, including the General Conditions, and Supplementary Conditions of the Contract.
- B. Conductors shall be copper, 600 volt with type THW, THHN, THWN or XHHW insulation, unless otherwise specified elsewhere. Minimum wire size to be No. 12 AWG except control and signal conductors may be No. 14.
- C. Color code to be as follows:
Neutrals - white; Equipment Ground - green; 120/208 volt: Phase A - Black, Phase B - Red, Phase C - Blue. All switchlegs and control and interlock wiring shall be color coded with colors other than those above. Indicate colors used on final as-built drawings.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Conductors to be insulated, solid copper for sizes No. 10 and smaller. Conductors No. 8 and larger shall be stranded. Feeder conductors size AWG 2 and larger may be compact stranded aluminum wire, Triple E alloy. Use AL/CU lugs for all terminations using aluminum conductors,
- B. All taps and splices in No. 8 or smaller wire shall be fastened together by means of solderless twist-on type connectors. All taps and splices in wire larger than No. 8 shall be made with solderless compression or indenter type lugs and taped to provide insulation equal to the conductor.
- C. Where allowed by code, branch circuitry may be copper conductors in flexible metallic sheathed cable assembly with contiguous bonding strip and separate green copper ground conductor. Type MC or AC cable to be in concealed locations only. Conductors in armored cable shall be copper with THHN insulation and color coded.
- D. All power feeders and branch circuitry circuits No. 2 and smaller shall be wired with color coded wire with the same color used for a phase throughout the building. Power feeders above No. 2 shall either be fully color coded or shall have black insulation with color coded marking tape in all boxes and enclosures.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Wire in vicinity of heat producing equipment shall have type THHN type insulation.
- B. Protect all conductors from damage during installation and prior to installation of covers, devices and equipment.
- C. Wiring in lighting fixtures to have insulation rating as required by fixture manufacturer.

- D. All conductors to be sized per the National Electrical Code. Maximum voltage drop for all panel feeders shall be 3%. Maximum voltage drop for all branch circuits shall be 5%. Voltage drop to be measured at farthest point on a particular circuit to determine branch circuit maximum voltage drop.
- E. Conductors installed in underfloor raceway system shall be copper, THHN, minimum #12 AWG. Install per manufacturer's instructions.
- F. All panel feeders to have 25% spare capacity above calculated demand load. All panel feeders to be conduit and wire.

END OF SECTION

SECTION 26 05 26 - GROUNDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Maintain existing service entrance grounding per Code and City of Port Orchard and Puget Sound Energy (PSE).
- B. All electrical equipment, metallic conduit, raceways, devices, motor frames, HVAC equipment, panelboards, etc. shall have equipment grounding system per Code requirements. System grounding conductor shall run from the main switch ground to all panel and from grounding lugs on each panel to each branch circuit outlet box and device in accordance with the NEC requirements.
- C. Provided service grounding for generator per Code and City of Port Orchard.
- D. Conform to the requirements of Division 00 and 01, including the General Conditions, and Supplementary Conditions of the Contract.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Panel feeders and power circuits shall be grounded with code sized insulated equipment grounding conductor. Metallic conduit may be used for equipment grounding conductor for lighting and where permitted by code.
- B. All flexible metallic conduit and armored cable used for power and lighting shall be equipped with a green, insulated copper equipment grounding conductor, code sized. Bond to boxes and equipment or device at each box.
- C. Grounding electrodes to be sized and installed per NEC and City of Port Orchard requirements. Ground clamps to be cast bronze.
- D. Provide ground bar in IT Room and in Main Electrical Room for equipment grounding. See drawing for details.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. All circuitry installed in non-metallic conduit to be equipped with code sized equipment grounding conductor.
- B. All circuitry installed in flexible steel conduit to be equipped with code sized equipment grounding conductor. Flexible conduit up to 6' in length may be used as the equipment grounding conductor for lighting circuits as allowed by code.

- C. Provide code sized equipment grounding conductor in all raceways serving power receptacles and devices.
 - D. Conduit sizes shall be adjusted as required to allow for equipment grounding conductors.
 - E. Provide ground conductor in surface mounted raceways for power outlets.
 - F. Provide separate isolated ground bus in panelboards serving isolated ground devices. Pull separate isolated ground conductor, green with yellow stripe, from device to service ground.
- 3.2 TESTING
- A. Test entire grounding system for continuity and correct any dis-continuities or high resistance circuits. Maximum resistance to ground shall be 3 ohms.

END OF SECTION

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Furnish and install all supports, hangers and inserts, etc. required to mount equipment, cabinets, fixtures, conduit, cables, pull boxes and other equipment under this Division.
- B. Supports and hangers shall be code-approved for the type of application.
- C. Conform to the requirements of Division 00 and 01, including the General Conditions, and Supplementary Conditions of the Contract.
- D. Provide reinforced concrete bases for lighting standards, pedestals, cabinets and generator. See Section 03 3000.

PART 2 - MATERIALS

2.1 MATERIALS

- A. Supports, hangers, etc. shall be designed for the specific application.
- B. Supports, hangers, etc. shall be structurally sized for the type of load being supported.
- C. Unistrut, Kindorf, or Super Strut are approved manufacturers.
- D. All materials exposed to moisture or dampness shall be manufactured with the specific application for the location installed. All steel to be galvanized with paint to match adjacent surface color(s) as required by Architectural conditions. Fasteners and hardware to be stainless steel.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. All items shall be supported from the structural portion of the building.
- B. Supports, hangers, etc. shall be installed in an approved manner and as recommended by manufacturer.
- C. Lighting fixture pendants to be supplied by manufacturer of fixture with stems, canopies and swivel base, painted to match fixture finish. Length of pendants to be as required to achieve required mounting height.
- D. Provide required supports for pendant lighting fixtures per manufacturer's recommendations.

END OF SECTION 260529

SECTION 260533 - RACEWAY AND BOXES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. All wiring to be in conduit unless specified otherwise. Conduit shall be rigid galvanized steel conduit (GRS), electrical metallic tubing (EMT), Intermediate Metal Tubing (IMC), flexible metal conduit, heavy wall Schedule 40 PVC and electrical non-metallic tubing (ENT).
- B. Panel Feeders above ground to be in Intermediate Metal Tubing (IMC) or electrical metallic tubing (EMT). Underground feeders to be Polyvinyl Chloride (PVC) Schedule 40.
- C. Branch circuit wiring may be metal clad cable, type MC where permitted by codes. Provide suitable metal outlet boxes with appropriate connectors.
- D. For all concealed or surface outlets serving lighting fixtures, switches, receptacles, control devices, etc., code approved outlet boxes shall be provided with trim and mounting hardware.
- E. Surface or flush junction or pull boxes shall be provided as required to facilitate branch circuit wiring or feeder conductor installation and as required by Code. No feeder or branch circuit conduit run may exceed three (3) 90E bends or 75 feet in total length without a junction or pull box.
- F. Multi-outlet surface wireways for electrical receptacles.

PART 2 - PRODUCTS

2.1 MATERIALS - RACEWAYS

- A. Rigid galvanized steel conduits, heavy wall, shall be used for all raceways underground.
- B. Underground conduits shall be joined to prevent entrance of moisture. Use joint sealing compound on threaded fittings in rigid galvanized steel conduit. Apply two coats of Kipper's Bitumastic No. 50 compound to entire length.
- C. Electrical metallic tubing may be used for all raceways above slab where not subject to mechanical injury or dampness. Under no circumstances will electric tubing be allowed underground. Tubing shall be joined with set screw fitting up to 2" where compression type fittings shall be required.
- D. All connections to motors or vibrating equipment or at other locations where required shall be made with not less than 24" of flexible zinc-coated steel conduit, using special type of connectors for this conduit. Flexible conduit shall be liquid-tight with approved fittings in wet or damp locations.

- E. Install insulating bushings on all rigid galvanized steel conduits terminating in panels, cabinets or boxes. Material in these bushings must not melt or support flame.
- F. PVC conduit may be used for underground raceways and service entrance as allowed by codes and serving utility company. PVC fittings shall be produced by same manufacturer supplying the conduit. All joints shall be solvent welded. Threads will not be permitted on PVC conduit. Installation of PVC conduit shall be in accordance with manufacturer's recommendations and codes. Long sweep elbows to be used for all underground service conduits as required by PSE.
- G. Metal clad cable type MC shall be installed per Code using special fittings approved for intended purpose. Conductors shall be THHN insulated copper.

2.2 MATERIALS, SIZING AND TRIM - BOXES

- A. Outlet boxes shall be standard stamped galvanized steel, one-piece.
- B. Outlet boxes shall be of such form and dimension as to be adapted to the specific use, location and type of device or fixture to be used. Box sizes shall be determined in accordance with the NEC requirements for conductor fill, with or without devices as necessary.
- C. Ceiling outlet boxes shall be 4" octagonal or 4" square x 1½" deep or larger as required with appropriate trim rings and fixture or device mounting hardware as required.
- D. Switch, wall receptacle and other outlet boxes in plastered or gypsum board wall and exposed masonry walls shall be minimum 4" square x 1½" deep minimum. Provide a standard trim ring of appropriate depth and opening to suit device.
- E. Outlet boxes exposed to weather shall be cast iron or aluminum with gasketed covers and threaded hubs for conduits. Boxes shall be weatherproof or watertight as required by Code.
- F. Junction and pull boxes shall be galvanized steel with screw-secured blank covers for surface mounting as required. Boxes shall be sized for conduits entering and conductor fill in accordance with Code requirements. Boxes exposed to weather shall be weatherproof or watertight as required by Code.

PART 3 - EXECUTION

3.1 INSTALLATION - RACEWAY

- A. All conduits and armored cable shall be run in neat and workmanlike manner, and shall be properly supported with approved conduit clamps, hanger rods and structural fasteners. All conduits except those from surface mounted devices or fixtures shall be run concealed from view.

- B. Exposed conduits shall be supported with clamp fasteners with toggle bolts on hollow walls or ceilings and with lead expansion shields on concrete. Rigid steel box connections shall be made with double locknuts and bushings.
- C. All conduits shall be kept clear of plumbing fixtures to facilitate repair or replacement of said fixtures without disturbing wiring. Except for control purposes, all conduits shall be kept away from items producing heat.
- D. Conduits shall be concealed in all areas. Surface conduits shall be run parallel with building lines in such a manner as to not detract from Architectural appurtenances or aesthetics. Contractor to attend pre-installation meeting to review all feeder and branch circuit routing with Architect. Paint surface raceways to match wall / ceiling colors.
- E. Conduits underground shall be minimum 18" below finished grade or slab, 36" where installed in right-of-way.
- F. Maintain existing raceways and boxes required to serve existing equipment to remain. Remove all unnecessary raceways and boxes per Section 024126.
- G. Telephone and Cable Television conduits shall be of the size, number and type required by installer. Provide junction boxes as required for all devices.

3.2 INSTALLATION - BOXES

- A. All flush mounted outlets shall be mounted such that covers and plates will fit tight to finished surfaces without the use of shims or mats. Plates shall not support wiring devices.
- B. Height of wall outlets to centerline above finished floors shall be as follows:
 - Switches - 4'-0"
 - Receptacles - 1'-6"
 - Counter Receptacles - 42" or as indicated on drawings. Telephone - 1'-6"
 - Wall Telephone - 4'-0" Television - 1'-6"
 - Fire Alarm Pull Station - 4'-6"
 - Fire Alarm Speaker/strobe - 6'-8" or 6" below ceiling

Note: All mounting heights to be verified with Architect and shop drawings prior to installation. All device mounting box mounting heights to conform to local codes and ADA.

- C. Height of wall mounted lighting fixtures shall be as required by Architectural conditions and Code.
- D. Outlet boxes shall be mounted true and straight in relation to surrounding building elements.
- E. Label all outlet boxes as to the system they serve. Fire alarm boxes to have red covers. Control boxes to have blue cover. Identify telephone and cable television boxes.
- F. Verify exact location of all flush boxes with Architect.

- G. Set flush single gang outlet boxes horizontally at all multi-outlet surface metal raceways to feed power and data to raceways as indicated on drawings. Verify exact location with Architect.

END OF SECTION

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SERVICES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Electrical equipment identification shall include color coded phenolic nameplates for all service and distribution equipment, starters, disconnects, and fused switches including use size and type.
- B. Conform to the requirements of Division 00 and 01, including the General Conditions, and Supplementary Conditions of the Contract.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Equipment Nameplates:

- 1. Nameplates shall be laminated plastic, engraved in 1/16" thick phenolic letters, a minimum of 3/16" high, as follows:
 - A. White letters on black background for equipment served by building normal service.
 - B. White letters on grey background for equipment served by standby generator system.
 - C. White letters on blue background for control and signal equipment and boxes.
 - D. White letters on red background for fire alarm equipment and boxes.
- 2. Where applicable, nameplates shall include source panel, fuse size and type, e.g., disconnects, motor starters, etc.

PANEL 5B
120/208V 3φ 4W
FEDFROMPNL 4C

Provide complete list of proposed nameplates with submittals.

- B. Mounting: Nameplates shall be attached with a minimum of two 6-32 roundhead screws, lockwasher and nuts.
- C. Junction and Pull Box Identification: Mark the cover of all junction boxes and pull boxes to identify the system, circuits, or feeders contained within the box. Use red color for fire alarm. Power circuits to have specified circuit numbers contained within the junction box.
- D. Provide all Arc Flash Labeling as required by NFPA 70E. Labels to be 4 inches by 6 inches wide. Label all controlled receptacles and GFCI receptacles. Provide circuit identification on all receptacles.
- E. Provide sign at Medical Trailer power outlet to indicate service disconnect location.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Clean all surfaces prior to installing labels. Where identification is to be applied to surfaces which require finish, install identification after completion of painting.

END OF SECTION

SECTION 26 24 16 - PANELBOARDS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Panelboards shall comply with NEMA standards, shall be UL listed and have an Integrated Equipment Rating.
- B. Submit shop drawings to the Architect in accord with the General Conditions and General Requirements. Shop drawings shall include the Panel Schedules for all panels and load centers. Include Rating Standards, Circuit Breaker Withstandability Data and individual circuit rating, poles, and load information.
- C. Balance loads on all phases of all panelboards.
- D. Conform to the requirements of Division 00 and 01, including the General Conditions, and Supplementary Conditions of the Contract.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Panelboard enclosure cabinets shall be of code gauge galvanized steel. Trim and door to be suitable to the mode of mounting, and shall be primed and painted in the manufacturer's standard color. Manufacturer: Square D, Cutler-Hammer or General Electric.
- B. Panelboard doors shall be provided with lock, flush cylinder tumbler type and furnished with two keys for each lock.. Locks shall be keyed alike.
- C. Locate branch circuit directory inside the panelboard door. Directory shall consist of a metal frame, clear plastic cover and typed circuit directory. Label all panelboards.
- D. Provide equipment grounding bar in all panelboards. Provide bonded ground lug in the main panelboard.
- E. Provide isolated ground bar separate from equipment ground bar in panelboards serving circuits with isolated ground devices.
- F. Circuit breakers in panelboards shall be UL labeled, bolt-on, thermal magnetic type, and shall have an interrupting rating of minimum 10,000 AIC. Higher fault current ratings may be required to withstand available fault current. Coordinate fault current ratings with serving utility and provide devices of adequate rating.
- G. Circuit breakers in Distribution Panelboard shall be UL labeled for service entrance equipment, dead front, and shall have be series rated. Provide trip coordination study for service equipment.
- H. Main circuit breakers shall be bolt-on, thermal magnetic type and shall be capable of

being padlocked in the OFF position.

- I. All multi-pole circuit breakers shall be single operating, common trip with single handle.
- J. Circuit breakers installed in existing panelboards and load centers to be of the same manufacturer as panelboard. Match fault current ratings.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Mount panelboards plumb with the top of panelboard at 72" above finished floor.
- B. Furnish and install typed branch circuit directory for all new and existing panelboards and load centers. Label all panelboards.
- C. Provide minimum 10% space in all panelboards.
- D. Locate Panelboards and as indicated on drawings.
- E. Identify branch circuitry on as-built drawing indicating the exact circuits as installed. Include panelboard schedules.

END OF SECTION

2.3 CATCH BASINS

- A. Lid and Frame: Metal frames, grates and solid metal covers shall meet the requirements of WSDOT Section 9-05.15(2) for cast steel; Class 30 cast iron as specified in WSDOT 9-06.8, 9-06.9, and 9-06.14; and as illustrated in the WSDOT Standard Plans and as indicated on the plans.
- B. Catch basins and Manholes: Reinforced pre-cast concrete catch basins and manholes shall be as indicated on the plans and shall meet the requirements of WSDOT Section 9-12.4 and 9-12.5 in conformance with AASHTO M199.
- C. Bedding and Backfill Materials
 - 1. Bedding: Gravel Backfill for pipe bedding shall be as specified in Section 32 05 16 or as indicated on the plans.
 - 2. Backfill: Fill shall be as specified in Section 31 23 23.

2.4 PRECAST FILTERRA UNIT

- A. Filterra is manufactured by Contech. Size and location are noted on the Storm and Grading Plan Sheet.
- B. All components of the system are supplied by the manufacturer including the precast unit, mulch, filter media, under drain and tree.
- C. Installation of the Unit shall be per manufacturers' recommendations and noted on the Storm and Grading Plan Sheet.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that trench cut or excavation base is ready to receive work and excavations, dimensions, and elevations are as indicated on layout drawings.

3.2 PREPARATION

- A. Hand trim excavations to required elevations. Correct over excavation with aggregate. Contractor is responsible for providing temporary shoring as required to complete the excavation and installation of the pipe or structure. The Contractor is responsible for means, methods, and design of shoring system.
- B. Remove large stones or other hard matter that could damage piping or impede consistent backfilling or compaction.
- C. Erosion control facilities, at the locations shown on the plans, are to be installed prior to clearing operations. Contractor is responsible for the maintenance and upgrade of these erosion control facilities throughout the duration of the construction project. Temporary silt fences are to be installed in conformance with WSDOT Section 2-12.3(5).
- D. At the completion of the construction project and after the site has been stabilized, all erosion control facilities are to be removed by the contractor.

3.3 BEDDING

- A. Excavate pipe trench in accordance with Section 31 23 17 in conformance with WSDOT Section 7-02.3(1). Hand trim excavation for accurate placement of pipe to elevations indicated.
- B. Place bedding material at trench bottom, level materials in continuous layer not exceeding 8 inches compacted depth.
- C. Maintain optimum moisture content of bedding material to attain required compaction density.

- A. Any material and/or procedure specified by reference to the number, symbol, or title of a specific standard such as a commercial standard, Federal specification, a trade association standard, technical society standard, or other similar standard, shall comply with the requirements of the latest revision thereof and any amendment or supplement thereto, in effect on the date of Advertisement for Bids, except as modified in the Specifications, shall have full force and effect as though printed in the Specifications.

1.6 OWNER OBLIGATION

- A. Neither Owner nor Architect is responsible for monitoring Contractor' compliance with codes, laws or other Regulatory Requirements.
- B. Reviews performed or failed to be performed by Owner, Architect, and other consultants under employment by Owner do not waive or change Contractor obligations, and do not constitute approval of the Work or portions of the Work.

1.7 CONTRACTOR REQUIREMENTS

- A. Perform Work in accordance with requirements of governing agencies, including Regulatory Requirements referenced by this Section and other Contract Documents.
- B. Schedule and coordinate inspections and gain approvals required by governing agencies in timely manner, as necessary for Owner occupancy of site within Contract Time.
- C. Inform Department of Construction and Inspections, Fire Department, and other governing agencies in timely manner of changes in the Work affecting Regulatory Requirements.
- D. Promptly forward to Architect, inspections reports, orders, permits, and other directives and correspondence received from inspector or governing agency having jurisdiction over the Work.
- E. Promptly notify Architect where Contract Documents appear to conflict with Regulatory Requirements.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION 01 41 00

SECTION 26 27 26 - WIRING DEVICES AND TRIM PLATES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Provide all wiring devices and appropriate trim or cover plate.
- B. Provide two-piece steel surface raceways with duplex receptacles as indicated on drawings.
- C. Conform to the requirements of Division 00 and 01, including the General Conditions, and Supplementary Conditions of the Contract.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Receptacles and switches shall be specification grade. Receptacles shall be duplex grounding type, 20 Amps UNO. Switches shall be 20 Amp, quiet type.
- B. Special receptacles shall be as required for equipment. Verify requirements with equipment supplier.
- C. Ground fault interrupter receptacles shall be 15 Amp with test switch. Feed-thru type is acceptable for down-circuit protection. Exterior mounted GFI receptacles to be provided with in-use weatherproof cover and gasket.
- D. Isolated ground duplex receptacles shall be 20 Amp, isolated ground type with orange face and trim.
- E. Surface metal raceways to be two-piece, single or double compartment, steel with back feed from flush outlet box(es). Receptacles to be alternately circuited when fed with two circuits. Wiremold 3000 series for single compartment, Wiremold 4000 series for dual compartment. Provide devices and trim plates, 24" OC.
- F. Where a single receptacle is on a dedicated circuit, the receptacle to be 20 Amp rated.
- G. Dual Technology Occupancy Sensors and Daylight Sensors for interior lighting controls shall be ceiling mounted, adjustable with contact ratings capable of controlling connected load. Dimming system to be compatible with controlled LED lighting fixtures. Provide relays to control circuits with loads greater than the switching capacity of device or to control multiple circuits. Provide low voltage switches, controllers and 0-10 volt wiring as required. Acuity Brands nLight or prior approved equal. See plans for locations.
- H. Wall box occupancy / vacancy switches to be utilized in rooms requiring automatic controls per Washington Energy Code. Switches to be PIR passive infrared with integral on/off switch. Occupancy sensors for storage rooms, utility rooms, pet care, kennels and restrooms. Vacancy sensors for offices.

- I. Provide wall stations for manual dimming controls. Replace existing light switches with line voltage dimmers in areas with no daylighting requirements. Lutron, Leviton or prior approved equal.
- J. All devices and trim plates except special receptacles shall be smooth, plastic, white color. Leviton, Hubbell, General Electric, Pass & Seymour.
- K. Provide LED receptacle trim plates with automatic on/off photosensor for night lighting as indicated on drawings and as directed by Owner. Color to match device color. Snap Power Guidelight 2.
- L. Provide receptacles in Kitchen as indicated and as required by Kitchen equipment installer. Coordinate special requirements with installer. Cover plates in Kitchen shall be satin, stainless steel.
- M. Provide wall box 30 minute spring-wound timers for utility rooms and storage rooms as indicated. Tork, Intermatic or prior approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install all devices straight and plumb. Cover plates shall fit securely and tightly against wall and device. Cover plates shall not support devices.
- B. Two or more switches or receptacles in same location shall be mounted in multi-gang boxes with one-piece trim plate.
- C. Special devices shall be installed as required for equipment. Verify requirements with supplier.
- D. Provide isolated ground duplex receptacles as required by Owner's IT group.
- E. Provide receptacle within 25' of mechanical equipment.
- F. Provide ground fault receptacles in all bathrooms, counters with sink, elevator machine room and exterior locations as required by Code.
- G. Light switches to be located on latch side of door leading into room. Provide local switching and automatic controls for all lighting as required by the Washington State Energy Code.
- H. Provide 10% LED receptacle trim plates for spares.

END OF SECTION

SECTION 26 28 13 - FUSES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Provide all fuses as required including spare fuses mounted in Owner's fuse cabinet.
- B. Materials shall be new, free from defects and arrive at job site unopened in original containers.
- C. Make all necessary provisions for storing materials and equipment at job site so as to ensure the quality and fitness of the items to be incorporated in the work. Equipment shall be stored to prevent damage and corrosion.
- D. Conform to the requirements of Division 00 and 01, including the General Conditions, and Supplementary Conditions of the Contract.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Provide fuses as required per NEC, and as required for a fully operational system. Fuses to limit fault current to within equipment ratings. Provide fault current coordination study to size equipment and rating of bracing capability.
- B. All fuses shall be of the same manufacturer.
- C. All fuses shall be installed by the Electrical Contractor at jobsite and only when equipment is to be energized. Fuses shall not be installed during shipment.
- D. Fuses:
 - 1. For feeders 600 amps and less:
 - a. Class RK-1, LPS-RK for 600 volt, dual element.
 - b. Class RK-1, LPS-RK for 250 volt, dual element.
 - c. Class J, LPJ for 600 volt and below, dual element.
 - 2. For motor circuits 600 volts and below:
 - a. Class RK-1 and Class J sized at 125% FLC of motor.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Spare Fuses: At the completion of the project, provide one complete set of spare fuses (three fuses to a set) for each size and type shown. Any spare fuses utilized during testing must be replaced in order to leave the Owner a complete set of spare fuses at the completion of the project.
- B. Indicate fuse type and sizes on as-built drawings.

END OF SECTION

SECTION 262819 - ENCLOSED SWITCHES

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Provide disconnects at all motors and other equipment items unless the equipment has a self-contained, code approved disconnecting method. Equipment disconnects shall be fused or non-fused as required by the equipment manufacturer.
- B. Motor and equipment disconnect switches shall be NEMA rated and UL listed and shall meet the requirements of the National Electrical Code and local codes.
- C. Conform to the requirements of Division 00 and 01, including the General Conditions, and Supplementary Conditions of the Contract.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Manufacturer: Square D or Cutler Hammer.
- B. Switches shall have enclosure suitable for the environment they are mounted in.
- C. Nameplates: Provide engraved phenolic nameplates, permanently attached per section 16195.
- D. Single-Phase Motor: Provide toggle type, 20-amp, 120-volt rating, specification grade for motors 1/3 HP or less, 120 volt, single-phase.
- E. Three-Phase Motor: Provide horsepower rated, multi-pole, fused or non-fused switch.
- F. Equipment disconnects shall be fused or non-fused as required by the equipment manufacturer, rated at 125% of full load nameplate amperage or rated horsepower, heavy-duty type.
- G. Generator service disconnect switch to be service entrance rated (SE).

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Location of all disconnects shall conform to code requirements and as required to allow proper access to the equipment being served.
- B. Securely mounted to separate structural support. Disconnects supported only by raceways will not be acceptable. Maximum height of 6'-0" above floor
- C. Label all disconnect switches.

- G. Provide auxiliary contacts as required to interface with signals from other systems.
- H. Provide auxiliary contacts as required to interface with solid state VFD starters when applicable.

END OF SECTION

SECTION 262913 - MOTOR CONTROL

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Motor starters for all equipment requiring them shall be furnished and installed under this section of the specifications. All starters shall be of the same manufacturer.
- B. Control wiring for motor starters for all equipment requiring them shall be furnished with equipment.
- C. Provide interlock wiring between control devices and other systems where required.
- D. Reduced voltage starters or variable frequency drive starters to be provided with equipment requiring such motor starters. Provide connections only.
- E. Conform to the requirements of Division 00 and 01, including the General Conditions, and Supplementary Conditions of the Contract.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Motor starters shall be across-the-line magnetic type rated in accordance with NEMA Standards, sizes and horsepower ratings. Starters shall be gravity dropout, and mounted in general purpose enclosures, unless otherwise indicated. Starters shall be equipped with double break silver alloy contacts. All contacts shall be replaceable without removing power wiring or removing starter from enclosure. Coils shall be of molded construction. All coils shall be replaceable from front without removing starter from enclosure. Overload relays shall be provided in each phase, and shall be melting alloy or bimetallic type. Bimetallic type shall have provisions to require manual reset.
- B. Starters shall be equipped with two normally open auxiliary contacts, and shall be suitable for the addition of at least two additional external electrical interlocks of any arrangement normally open or normally closed. All starters shall have green "run" pilot light, "HAND-OFF-AUTO" selector switch and nameplate.
- C. Starter sizes, voltage, etc. shall be as required to accommodate motor rating. Manufacturer shall be Square D or prior approved equal. Starter sizes, voltage, etc. shall be verified by Contractor.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install as required and per manufacturers' instruction. Provide engraved rigid plastic nameplates for each motor starter per section 260553.
- B. Location of all starters shall conform to code requirements and as required to allow proper access to the equipment being served.

- C. Securely mounted to separate structural support. Starters supported only by raceways will not be acceptable. Maximum height of 6'-0" above floor
- D. Coordinate motor starter sizes and overload relay ratings with equipment furnished to assure proper match.
- E. Provide auxiliary relays as required to interface with signals from other systems. See Section 283100.

END OF SECTION

SECTION 26 32 13 - GENERATORS AND TRANSFER SWITCH

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The diesel generator and transfer switch covered by these specifications shall be designed, tested, rated, assembled and installed in strict accordance with all applicable standards of ANSI, NEC, ISO, UL508, IEEE, NETA and NEMA..
- B. The work includes supplying and installing a complete and operational integrated NEC 701 Stand By generator system. The system consists of a pad mounted diesel generator set with related component accessories and automatic transfer switch.
- C. Submit shop drawings to the Architect in accord with the General Conditions and General Requirements. Shop drawings shall include the factory published specification sheet indicating the generator performance data, dimensional elevation and layout drawings, generator accessories, exterior enclosure, skid mounted fuel tank, concrete pad requirements with layout and stub-up locations, interconnect wiring diagram of complete generator controls and accessories, mechanical data including heat rejection, exhaust gas flows, combustion air and ventilation air flows, fuel consumption and dBA noise levels and automatic transfer switch.
- D. The generator set and automatic transfer switch shall be supplied by the Manufacturer's authorized distributor only. The engine-generator supplier shall maintain 24-hour parts and service capability. The dealer shall maintain qualified factory trained service personnel.
- E. Conform to the requirements of Division 00 and 01, including the General Conditions, and Supplementary Conditions of the Contract.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Generator set shall be ISO 9001 Tier 3 EPA - certified for stationary emergency applications, 150 KW, 120/208 volts, 3 phase, 4 wire, 60 Hertz. Engine to be 1800 rpm, 6 cylinder turbocharged, air cooled, 6.8 Litres, 17:1 compression ratio, 177 kWm max power at rated rpm. Generator to be 4-pole, rotating field, brushless permanent magnet, solid state voltage regulator, NEMA MG1 insulation, vacuum-impregnated windings with epoxy varnish. Voltage regulator shall maintain generator output voltage within +/- 0.5% for any constant load between no load and full load. Generator to be provided with a generator mounted enclosed circuit breaker as indicated on plans. Kohler Model 150REOZJF.
- B. Generator control panel to be solid state design and provide complete control and monitoring of the engine and generator set functions. Panel shall include automatic start/stop operation, cycle cranking, AC metering with phase selector switch, shutdown sensors and alarms with horn and reset, adjustable cool down timer and emergency stop push-button. Control panel to display:
Readouts:
 - 1. Engine oil pressure
 - 2. Coolant temperature
 - 3. Engine RPM
 - 4. System DC voltage

5. Engine running hours
6. Generator AC voltage
7. Generator frequency
8. Generator AC amps

Alarms:

1. Low oil pressure
 2. High water temperature
 3. Low coolant level
 4. Over-speed
 5. Over-crank
 6. Emergency stop depressed
 7. Approaching high coolant temperature
 8. Approaching low oil pressure
 9. Low coolant temperature
 10. Low battery voltage
 11. Control switch not in auto position
 12. Low fuel main tank
 13. Battery charger failure
 14. High battery voltage
- C. Remote annunciator to meet the requirements of NFPA 110, Level 1. The annunciator shall provide remote annunciation of all points stated above and shall incorporate ring- back capability that after silencing the initial alarm, any subsequent alarms will sound the horn. Locate as indicated on the drawings.
- D. Accessories to be supplied by the generator supplier including but not limited to 12 volt batteries and battery rack, equalize/float type battery charger, battery heater, 1800 watt block heater, weatherproof enclosure with convenience receptacle and lighting.
- E. A double wall skid mounted fuel tank to be provide with generator set. Fuel capacity to be 595 gallons. Tank shall be pressure tested for leaks prior to shipment and have venting per UL 142. A locking fuel cap, a mechanical reading fuel level gauge, low fuel alarm contact and fuel tank rupture alarm contact shall be provided. Contractor to provide a full tank of diesel fuel for testing and at substantial completion.
- F. Provide equipment grounding bar in generator enclosure.
- G. Automatic Transfer Switch shall be as shown on drawings, 120/208 volt, 3 phase, 4 wire, 60 Hertz, open transition switch conforming to UL1008, IEC 60947-6-1, NFPA 110, IEEE Standard 446, UL 508. Transfer switch to be electrically operated and mechanically held. The electrical operator shall be a momentarily energized, single- solenoid mechanism. The switch shall be mechanically interlocked to ensure only two possible positions. The switch shall be positively locked and unaffected by momentary outages so that contact pressure is maintained at a constant value and contact temperature rise is minimized for maximum operating life. All contacts shall be silver composition. A single micoprocessor controller with a four line, 20 character LCD display and keypad shall provide sensing and logic by a single built-in controller with the ability to communicate serially through an optional serial communication module. The ATS shall be furnished in a Type 1 enclosure. ASCO or prior approved equal.

- H. Automatic Transfer Switch controller shall display the following parameters and shall only be adjustable via DIP switches on the controller;
 - 1. Nominal line voltage and frequency
 - 2. Single or three phase sensing
 - 3. Operating parameter protection
 - 4. Transfer operating mode configurationAll instructions and controller settings shall be easily accessible, readable and accomplished without the use of codes, calculations or instruction manuals.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Install equipment in accordance with manufacturers' recommendations, the project drawings and all applicable Codes.

3.2 START-UP AND TESTING

- A. Coordinate all start-up and testing activities with Engineer and Owner.
- B. After installation is complete and normal power is available, the manufacturer's local dealer shall perform the following:
 - 1. Verify that the equipment is installed properly.
 - 2. Check all auxiliary devices for proper operation, including battery charger, jacket water heater, generator space heater, remote annunciator, etc.
 - 3. Test all alarms and safety shutdown devices for proper operation and annunciation.
 - 4. Check all fluid levels.
 - 5. Start engine and check for exhaust, oil or fuel leaks, unusual vibrations, etc.
 - 6. Verify proper voltage and phase rotation at the transfer switch before connecting to the load.
 - 7. Connect the generator to the building load and verify that the generator will start and run all designate loads.
 - 8. The system shall be tested under full load and monitor the following:
 - a. Oil pressure
 - b. Coolant temperature
 - c. Battery charge rate
 - d. AC voltage
 - e. AC Amperes - all phases
 - f. Frequency
 - g. Kilwatts
 - h. Ambient Temperature

3.3 OPERATION AND MAINTENANCE MANUALS

- A. Provide two (2) sets of operational and maintenance manuals covering the generator, switchgear, and auxiliary components. Include final as-built wiring interconnect diagrams and recommended preventative maintenance schedules.

- B. Include all test results in O&M Manuals.

3.4 TRAINING

- A. On-Site Training: Provide one day of on-site training to instruct the Owner's personnel in the proper operation and maintenance of the equipment. Review operation and maintenance manuals, parts manuals and emergency service procedures.

END OF SECTION

SECTION 265100 - INTERIOR LUMINAIRES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Fixtures furnished under this Division shall be complete with all necessary trim and mounting hardware, and installed per manufacturer's instruction.
- B. Furnish and install complete and operating interior lighting fixtures complete with wiring, controls, lighting fixtures and lamps as listed in Lighting Fixture Schedule.
- C. Installation shall be in conformance with the requirements of the Illuminating Engineering Society; the National Electrical Code; Americans with Disabilities Act (ADA); ANSI A117.1-2003 and the Washington State Energy Code
- D. All lighting equipment and fixtures shall bear the UL label and be listed for the type of construction installed.
- E. Furnish and install all required self-contained exit and emergency lighting fixtures.
- F. Conform to the requirements of Division 00 and 01, including the General Conditions, and Supplementary Conditions of the Contract.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Lighting fixtures shall be furnished in accordance with Lighting Fixture Schedule or subsequently approved substitutions. All lighting fixtures, accessories and lamps shall be furnished unless specifically noted.
- B. All fixtures to be factory pre-wired. Fixture supports shall be as required by the fixture manufacturer. Provide extra blocking or bracing for special fixtures or locations as required.
- C. LED fixtures shall provide rated fixture lumens as indicated on Lighting Fixture Schedule with internal specular aluminum light reflector and heat sink assembly . Fixtures shall be provided with integral driver(s) with dimming capabilities. Driver modules to be furnished with quick disconnect to allow module to be removed from housing without special tools. LED fixtures to provide consistent color temperature for 50,000 hours rated life at 45E C. maximum operating ambient temperature.
- D. Recessed lighting fixtures located in insulated ceilings shall be IC rated with integral thru-wire junction box.
- E. Dimming controllers to be located in daylighting zones as indicated on drawings. Dimming sensors to be 0-10 volt, open loop multi-zone digital photosensor. Leviton DRC..

- F. Dimming room controller module to interface photosensor devices, occupancy sensors and local switches via RJ45 Ports and CAT 5e cables. Connections to fixtures to be with Class 2 0-10 volt control wiring. Dimming room controller modules to be mounted adjacent to lighting control panel. Leviton DRC.
- G. Line voltage dimmers to SensorWorks SWX-823.
- H. Dimmers and wall plates to be white.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Fixtures shall be neatly and firmly mounted, using standard supports for outlets and fixtures. Ceiling finish material shall not support fixtures.
- B. Coordinate mounting heights for all wall mounted fixtures with Architect prior to rough-in.
- C. Fixtures less than five pounds may be supported from the outlet box by means of an interposed metal strap, hickey or other threaded connection.
- D. Fixtures more than five pounds, but less than 50 pounds may be supported from the outlet box by means of a hickey or other threaded connection.
- E. Fixtures in suspended ceiling to be supported by 2 minimum #12 gauge wire per fixture. Secure to structure above.
- F. Pendant mounted fixtures to be complete with all mounting hardware, self-adjusting stainless steel aircraft cable and canopies. Pendant lengths to be as required to mount fixtures at required mounting height.
- G. Provide exit and emergency illumination in all areas as required by Code.
- H. Night lighting to be provided by lighted receptacle trim plates. See 262726.
- I. Clean and relamp all existing lighting fixtures.
- J. Installed lighting illumination levels to be in conformance with the recommendations of the Illuminating Engineering Society (IES) and the NEC. Emergency lighting fixtures shall provide emergency lighting for minimum 1½ hours in all areas as required by codes. Provide required illumination levels in all areas as required by codes.
- K. All fixtures shall be set free of light leaks, wraps, dents or other objectionable characteristics.
- L. All lamps shall be operational at time of final acceptance. All fixtures and lamps shall be clean and operational at time of final acceptance.

3.2 SWITCHING OF LIGHTING FIXTURES

- A. Provide switching of all lighting fixtures as required by the National Electrical Code and the Washington State Energy Code.

- B. Provide all required occupancy sensors and daylighting controls as required by the Washington Energy Code.
- C. Local switching and dimming of all lighting fixtures in Sleeping Rooms shall be from lighting controls at Reception as indicated on drawings.
- D. Initial set up of all automatic lighting controls to be as directed by Owner's representative. Record settings on As-Built Drawings.

3.3 SPARE PARTS

- A. Provide 10% spare diffusers of each type used, packaged and marked to identify fixture type.

3.4 COMMISSIONING

- A. All lighting controls and lighting control components shall be commissioned prior to final acceptance. Commissioning shall be performed by a third party entity.
- B. Instruct Owner as to the operation and maintenance of all lighting controls systems and components.

END OF SECTION

SECTION 265600 - EXTERIOR LUMINAIRES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Fixtures furnished under this Division shall be complete with all necessary trim and mounting hardware, and installed per manufacturer's instruction.
- B. Furnish and install complete and operating exterior lighting system complete with wiring, controls, lighting fixtures, poles, supports and lamps. Installation shall be in conformance with the requirements of the Illuminating Engineering Society; the National Electrical Code; Americans With Disabilities Act (ADA) and the Washington State Energy Code.
- C. Provide all building mounted luminaires and select fixtures as defined in Lighting Fixture Schedule and as shown on drawings.
- D. Provide pole mounted LED luminaires and grade mounted LED bollards as indicated on plans. Pole and bollard concrete bases to be provided under Division 03.
- E. Exterior lighting levels and uniformity to be in conformance with guidelines set forth by the Illumination Engineering Society of North America (IESNA). Provide exterior lighting controls with manual override.
- F. Provide exterior emergency lighting as indicated and where required by Jurisdiction Having Authority (JHA).
- G. All lighting equipment and fixtures shall bear the UL label and be listed for wet or damp location as required.
- H. Provide exterior lighting controls as indicated on drawings and as required by the Washington Stste Energy Code.
- I. Conform to the requirements of Division 00 and 01, including the General Conditions, and Supplementary Conditions of the Contract.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Lighting fixtures shown on drawings shall be furnished in accordance with Lighting Fixture Schedule or subsequently approved substitutions. All lighting fixtures, accessories and lamps shown on the fixture schedules shall be furnished unless specifically noted.
- B. All fixtures to be factory pre-wired. Fixture supports shall be as require by the fixture manufacturer. Provide extra blocking or bracing for special fixtures or location as required.
- C. LED fixtures shall provide rated fixture lumens as indicated on Lighting Fixture Schedule with internal light reflector and heat sink assembly . Fixtures shall be provided with integral driver(s) with dimming capabilities. Driver modules to be furnished with quick disconnect to allow module to be removed from housing without special tools. LED fixtures to provide consistent color temperature for 50,000 hours rated life at 45E C. maximum operating ambient temperature.

- D. Exterior fixtures to be UL listed for wet or damp location as indicated on Lighting Fixture Schedule.
- E. Recessed lighting fixtures shall be provided with integral thru-wire junction box.
- F. Provide LED bollards with formed aluminum housing and poured concrete base footing for walkways. Coordinate with Landscape Architect.
- G. Exterior lighting shall minimize light trespass beyond the property lines while also providing light levels meeting IESNA guidelines. Illuminance shall not exceed 1 footcandle at any property line.
- H. Pole mounted luminaires to be LED with NEMA Type III, medium cut-off distribution, clear flat lens, IP55. Poles to be straight round steel. Provide base canopy.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Fixtures shall be neatly and firmly mounted, using standard supports for outlets and fixtures.
- B. Coordinate mounting heights for all wall and pendant mounted fixtures with Architect prior to rough-in.
- C. Coordinate mounting height and details for all building mounted fixtures with Architect.
- D. All fixtures to be clean and operating at time of acceptance.
- E. Clean and relamp all existing lighting fixtures.

3.2 LIGHTING CONTROL

- A. Exterior lighting to be controlled by photocell sensors and astro-dial digital time clock. Intermatic or Tork.
- B. Replace exterior lighting controls with new controls. Tie new fixtures into existing exterior lighting circuits as indicated on drawings.

END OF SECTION

SECTION 270000 - TELEPHONE AND DATA SYSTEM

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Provide all conduits, outlet boxes and power for low voltage work. All cables, jacks, racks, terminals, cabinets and connections for telephone / data wiring system to be by Owner's Sub-Contractor.
- B. Provide plywood backing for equipment mounting as indicated on drawings and as directed by Architect.
- C. Conform to the requirements of Division 00 and 01, including the General Conditions, and Supplementary Conditions of the Contract.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Provide minimum 3/4" conduit for cables to be installed in exposed locations.
- B. Provide minimum 2-gang outlet boxes for all telephone/data jacks. Coordinate jack arrangements with Owner.
- C. For all areas, provide 1- 3/4" conduit to TTB/ITB for each telephone outlet and each data outlet as required. Contractor may run up to three outlets per homerun, increasing conduit size by 1/4" for each additional outlet. Do not exceed maximum conduit fill of 40% conduit capacity per EIT/TIA-569.
- D. Interface with Fire Alarm Panel for Central Station Monitoring by Owner's Sub-Contractor. See Section 28 33 00.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Coordinate all telephone/data conduit sizing requirements and routing with Owner.
- B. Coordinate all telephone/data outlet box sizing requirements with Owner. Outlet boxes in finished areas to be flush mounted. Outlet boxes in utility rooms or unfinished areas may be surface mounted.
- C. Install receptacles and power to equipment racks in IT Rooms as required. See drawings for locations.
- D. Verify exact locations of devices with Architect prior to installation. August 25, 2023
- E. All telephone handsets, switching equipment, IT racks, servers and connections to be provided by Owner's Telephone/ IT system installer. Fully coordinate all installation requirements with Owner prior to installation of conduits and outlets boxes.

- F. All wiring to be concealed and installed in conduit where required by code. Maximum horizontal cable run shall not exceed 300 feet from mechanical termination to the device plate.

END OF SECTION

SECTION 281300 - ENTRY ACCESS / SECURITY SYSTEM

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Provide all conduits, outlet boxes and power for Entry Access / Security System. All cables, devices, terminals, control panels and connections for the Entry Access / Security System to be by Security Vendor.
- B. Provide power to all automatic doors and install door operators as required. See drawings for locations.
- C. Conform to the requirements of Division 00 and 01, including the General Conditions, and Supplementary Conditions of the Contract.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Provide minimum 1/2" conduit for cables to be installed in exposed locations.
- B. Provide minimum 2-gang outlet boxes for all Entry Access / Security System devices. Coordinate outlet box requirements with Vendor.
- C. Interface with Fire Alarm Panel for door release operation to be by Security Vendor. See Section 28 33 00.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Installation all wiring in accordance with Code requirements.
- B. All items of equipment shall be securely fastened in place.
- C. The complete system shall be tested to be free of grounds, shorts or open circuits. Operation of the complete system shall be tested and the system left in full operating condition.
- D. Coordinate mounting and exact location of devices with Architect prior to rough-in.
- E. Provide complete training to owner in operation and maintenance of system.
- F. Provide complete operation and maintenance instructions with wiring diagrams in O & M Manual.

END OF SECTION

SECTION 283100 - FIRE ALARM AND DETECTION SYSTEM

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Replace existing building fire alarm system with new fire alarm system. A new code approved, properly operating automatic fire alarm and detection system complete to include all required wiring, boxes, conduits, equipment, devices and interconnection with other systems.
- B. System to be a multi-zone, Class B, electrically supervised, non-coded type utilizing individually addressable manual pull stations, horns/strobes, mini-horns/strobes, smoke detectors, heat detectors, control panel with annunciator, remote annunciator and battery back-up.
- C. Connect to duct detectors, smoke dampers and devices as required.
- D. Contractor shall be responsible for preparing all drawings required to secure approval from the Port Orchard Fire Department. All Fire Alarm System devices and wiring shall be shown on as-built drawings.
- E. Fire Alarm System shall comply with the current provisions of the following standards:
 - 1. NFPA 72 - National Fire Alarm Code
 - 2. NFPA 70 - National Electrical Code
 - 3. NFPA 101 - Life Safety Code
 - 4. FM Factory Mutual
 - 5. Washington State Uniform Fire Code
 - 6. Americans with Disabilities Act (ADA)
 - 7. All requirements and regulations of the Port Orchard Fire Department

1.2 QUALITY ASSURANCE

- A. Fire alarm system to be installed by a factory trained and certified technician with no less than five (5) years active experience installing similar systems. Manufacturer shall maintain factory trained and certified personnel within 50 miles of the project site available for 24 hour maintenance and service to fire alarm system.
- B. Contractor shall coordinate with respective trades in order that a complete and operational fire alarm system

1.3 PERFORMANCE REQUIREMENTS

- A. Alarm condition. Operation of any alarm initiating device shall activate the following effects, and, unless specified otherwise, shall maintain them continuously until all alarm initiating devices are restored to the normal condition:
 - 1. Activate audible and visual alarm signals until alarm signals are reset to non- alarm condition. Alarms to provide minimum 92 dB or 15 dB above ambient sound level in all areas of the building.
 - 2. Remove motors of air handling equipment with 2,000 cfm or more capacity,

from their power source.

3. De-energize smoke damper hold-open devices and cause smoke dampers to close automatically.

- B. Alarm Initiation: General alarm condition to be caused by any one of the following circumstances:
1. Activation of any manual pull station.
 2. Activation of any system smoke or heat detector.
 3. Control panel to indicate zone of originating alarm device.
- C. Trouble Alarm Initiation: A distinct trouble alarm to sound and a LED light at control panel and remote annunciator shall illuminate upon the activation of the following conditions:
1. Any malfunction of any fire detector device. System to visually annunciate location of faulty device.
 2. Any circuit short or open condition. Excessive noise condition on the signaling line circuit.
 3. Activation of alarm silencing switch.
- Activation of any trouble condition shall not prevent the resounding of the control panel audible devices in the event of a subsequent trouble condition in other circuits. When the trouble is corrected the system shall not require manual restoration.
- D. Control Panel: Program new detectors such that each tenant space is assigned to a separate zone. Each zone shall have separate supervised zone trouble and zone alarm indication. The system shall have an operator's control panel that shall contain an alpha-numeric, electronic visual display device which shall show the time of day, day of week, month, and year. Upon the operator request, the normal visual display shall be replace with the status of any system point. Manual input shall be through the use of a keypad or keyboard.
- E. The receipt of an alarm shall be indicated by zone and type of alarm until acknowledged. In the event subsequent new alarms are received, they shall be stored in sequence and automatically displayed after acknowledgment of the previous alarm. When the alarm initiating device circuit is restored to normal, indication shall be given that the alarm zone can be reset.
- F. Remote Annunciator shall be graphic type with LED annunciation of the particular zone with alarm condition. Locate at building main entrance as directed by Port Orchard FM.
- G. UDAT monitoring shall be provided such that the transmission of a point IP address would be sent to the monitoring company. System shall be capable of transmitting multiple IP addresses simultaneously.

1.4 WARRANTY AND GUARANTEE

- A. Equipment manufacturer shall guarantee all equipment and devices and the proper operation of this system. Provide a five (5) year warranty against faulty materials or workmanship. During the first year, provide two inspections of the system (at 5th and 11th month) by the manufacturer's representative. These inspections shall consist of a complete operational testing of the system plus four hours training for on-site personnel. The Contractor shall guarantee all equipment and wiring free from inherent mechanical and electrical defects for a period of one year from the date of final acceptance.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Fire Alarm control panel shall be microprocessor based, supervised, dead front construction utilizing modular solid state components with line surge and static protection. System shall contain the following:
1. System reset switch and test switch
 2. Trouble alarm silence switch
 3. Municipal alarm disconnect switch
 4. Alarm or supervisory alarm acknowledgment
 5. Signal silence switch
 6. LED power, alarm, trouble and supervisory status indicators
 7. Manual disconnects for all auxiliary function controls
 8. Addressable power supply/battery charger with battery back-up
 9. Remote graphic annunciator panel
- B. Panel shall contain a micro-processor based Central Processing Unit (CPU) and power supply in a single board design. The CPU shall communicate with and control the following types of equipment used to make up the system: intelligent addressable smoke and thermal detectors, addressable modules, printer, annunciators and other types of system controlled devices. One, expandable to two, isolated intelligent Signaling Line Circuit connects up to 159 detectors and 159 modules per loop, Style 4,6 or 7. Standard 80-character display.
- C. Remote annunciator to be an 80 character, backlit liquid crystal display with system status, acknowledge, signal silence, drill and reset with enable key. Notifier # FDU-80. Remote annunciator to be installed in a clear, heated, key-lockable, NEMA 4X enclosure. Provide key box adjacent to annunciator.
- D. Manual Pull Stations to be installed in flush steel outlet boxes. Stations to be single action type, steel with red finish with raised letter operating instructions of contrasting color. Exterior manual pull stations, if required, to be furnished with clear plastic tamper resistant cover with integral battery operated horn.
- E. Automatic Smoke Detectors to be photo-electric type and shall incorporate a solid state voltage regulator which can maintain detection sensitivity over an input voltage range of 17-25.4 volts DC. Detectors to be shielded against electro-magnetic interferences.
- F. Mini-horns/ strobes shall be beige in color and shall produce 90 dB output at 10'-0". Strobe to produce 110 candela in each bedroom and living room, 75 candela in toilet rooms.
- G. Speaker horns/ strobes shall be 24 VDC polarized, modular design, mounted in flush steel outlet boxes, steel housing, red color. Where units are to be surface mounted Units to provide 92 dB in all areas of building and installed in accordance to codes.
Strobes to be 75 candela. Exterior horn/strobe to be in weatherproof housing.
- H. In all Bed Rooms and Sleeping areas, Low frequency sounders to be installed per NFPA 72 which utilize a 520 Hz (+/- 10%) square wave.
- I. Field charging power supplies shall be provided for power to notification devices and appliances. The FCPS shall provide up to 6.0 amps of regulated 24 VDC and include integral charger designed to charge 7.0 amp hour batteries to support 60 hour standby power.

2.02 CONDUIT AND WIRE

- A. Reuse any existing interior fire alarm conduits deemed suitable for use with the new fire alarm system installation at Owner's discretion. All existing wiring to be replaced with new conductors and meet the intent of these specifications.
- B. All wiring in finished areas shall be concealed where possible. Surface wiring in finished areas shall be run in surface metal raceway (SMR). Run SMR parallel to building lines. Wiremold V500. Paint to match wall / ceiling colors.
- C. All wiring to be installed in conduit or raceway where required. Conduit fill shall not exceed 40% of the interior cross sectional area. Fire alarm cable shall be separated from all power conductors or Class I circuitry and shall not be placed in any conduit, junction box or raceway containing these conductors per NEC.
- D. Wiring for 24 VDC control, alarm notification, emergency communication and similar power-limited auxiliary functions may be run in the same conduit as initiating and signaling line circuits. All circuits shall be provided with transient suppression devices and the system shall be designed to permit simultaneous operation of all circuits without interference or loss of signals.
- E. Wire and cable not installed in conduit shall have a fire resistance rating suitable for the installation as indicated in NFPA 70. All fire alarm field wiring shall be electrically supervised for open circuit or ground fault. Conceal all fire alarm wiring.
- G. Fire alarm control panel primary power wiring shall be 12 AWG. Provide dedicated 20 amp circuit from House Panel. The control panel cabinet and remote power panels shall be grounded.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. All exposed, visible devices shall be located as approved by both the Fire Marshall and Architect. Contractor's shop drawings shall locate all exposed, visible devices, for approval by Architect. Architect to be advised of any changes required by Fire Marshall prior to installation.
- B. The Contractor shall furnish and install in accordance with the manufacturers' instructions all wiring, conduit and fixture boxes required. All wiring shall meet the requirements of the National Electrical Code and the City of Port Orchard Electrical Code.
- C. Contractor to use color coding for all wiring.
- D. Smoke detectors shall not be mounted within four (4) feet of an air outlet.
- E. Protective covers shall not be removed from devices until Owner's acceptance of system.
- F. Provide complete operation and maintenance instructions and complete as-built record drawings.

END OF SECTION

SECTION 31 10 00 - SITE CLEARING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Clearing and grubbing of existing vegetation.
- B. Removal and disposal of existing vegetation and plant life.
- C. Removal of existing structures and improvements.

1.2 RELATED SECTIONS

- A. Section 32 05 16 - Aggregate Materials.
- B. Section 31 22 13 - Rough Grading.
- C. Section 31 23 18 - Rock Removal.
- D. Section 32 11 23 - Aggregate Base and Top Course

1.3 REGULATORY REQUIREMENTS

- A. Conform to applicable codes for environmental requirements, disposal of debris.
- B. Perform work in conformance with WSDOT Section 2-01.
- C. Coordinate clearing Work with utility companies.
- D. Contact Locate Companies prior to any clearing activities.
- E. Contractor is alerted to the existence of regulatory laws related to underground utilities. Costs related to damage are incurred at the contractor's expense according to RCW 19.122.
- F. Do not close or obstruct roadways, sidewalks, or hydrants without appropriate permits.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Not used.

PART 3 EXECUTION

3.1 PREPARATION

- A. Verify that existing plant life designated to remain is tagged or identified. Prior to the cutting of any trees, the Owner is to inspect the site and approve any trees identified for removal.
- B. Review site to confirm existing conditions and to identify existing facilities that must be removed to accommodate new work.
- C. Erosion control facilities must be installed and inspected by the City of Bremerton Public Works prior to the commencement of clearing operations.

3.2 PROTECTION

- A. Locate, identify, and protect utilities that remain, from damage.
- B. Protect wetland buffers, trees, plant growth, and features designated to remain.
- C. Protect benchmarks, survey control points, and existing structures from damage or displacement.

3.3 REMOVAL

- A. Remove debris, rock, and vegetation as required to complete work. Restore disturbed areas to their pre-construction condition after the completion of the construction operations. Natural wood debris cannot be burned on site. The Contractor, at their own cost, shall dispose of this material at a proper disposal site.
- B. Grubbing operations require the removal of the top 6" - 12" of material to ensure the organic matter and roots are removed from the site. The Engineer shall confirm the depth prior to removal. Also, any branches, roots, or wood debris 2" in diameter and larger must be removed to a depth of 2.0'. Disposal of this grubbed material is the responsibility of the contractor. The contractor must provide erosion control measures and a dozer to spread and shape the grubbed material at the disposal site.
- C. Contractor is to remove existing facilities as required to install new improvements. This includes, but is not limited to: asphalt pavement, concrete, and other existing improvements.

- D. Partially remove paving and curbs as indicated on the drawings. Neatly saw cut the edges at right angles to the surface.
- E. Stripping
 - 1. Strip topsoil from all areas to be excavated, filled or otherwise graded per Section 31 00 00, Earthwork.
 - 2. Remove topsoil to a depth of 6 inches, or as directed by the Owner.
- F. Handling and Use of On-Site Salvaged Topsoil
 - 1. Do not use topsoil removed by stripping for backfill or constructing embankments.
 - 2. Segregate and stockpile topsoil for use in restoration and planting work as described on Section 32 91 13, Soil Preparation, Finish Grading, and Erosion Control Fabrics, and as shown on the Drawings. Where approved in writing by the Owner, haul and dispose of excess topsoil with cleared material in accordance with Article 3.3.
- G. Stockpiling of On-Site Salvaged Topsoil
 - 1. Transport and stockpile topsoil as necessary prior to final hauling and placing.
 - 2. Do not compact topsoil in stockpile.
 - 3. Protect stockpile from weeds, contamination and erosion with secured plastic sheeting.
- H. Tree Protection
 - 1. Trees: Provide temporary flagging at the limit of clearing and grading adjacent to trees designated to remain. Do not operate vehicles or stockpile any material within the drip-line of existing trees unless specifically directed by the Owner. Protect trees with temporary chain link fencing per Section 32 93 10, Tree and Shrub Protection.

END OF SECTION

SECTION 31 22 13 – ROUGH GRADING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Grading, rough contouring, and sub-grade preparation for site structures to the lines and grades shown on the plans

1.2 RELATED SECTIONS

- A. Section 31 10 00 - Site Clearing.
- B. Section 32 05 16 - Aggregate Materials.
- C. Section 31 23 18 - Rock Removal.
- D. Section 31 23 16 – Excavation
- E. Section 31 23 23 - Fill.
- F. Section 31 23 17 - Trenching: Trenching and backfilling for utilities.
- G. Section 32 12 16 - Asphalt Paving.

1.3 REFERENCES

- A. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.
- B. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- C. Unanticipated Discovery Plan (UDP) for unanticipated discovery of cultural resources or human skeletal remains.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with WSDOT Standard Plans and Specifications.

1.5 PROJECT RECORD DRAWINGS

- A. Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Fill Material: as specified in Section 31 23 23, Fill.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that survey benchmark and intended elevations for the Work are as indicated on Drawings.

3.2 PREPERATION

- A. Call Local Utility Line Information service at 811 not less than 48 hours before performing Work. Utility Locates shall extend onto private property at project site.
- B. Identify required lines, levels, contours, and datum.
- C. Stake and flag locations of known utilities.
- D. Locate, identify, and protect utilities that remain, from damage.
- E. Protect above and below grade utilities that remain.
- F. Protect wetland buffer areas, plant life, lawns, and other features called out to remain.
- G. Protect bench marks, survey control point, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.
- H. Construction staking is to be performed or directly supervised by a Professional Land Surveyor registered in the State of Washington.

3.3 TOPSOIL EXCAVATION

- A. Excavate topsoil from areas to be further excavated, relandscaped, or regraded without mixing with foreign materials for use in finish grading.

- B. Stockpile in area designated on site to depth not exceeding 8 feet and protect from erosion. Stockpile material on impervious material, until disposal.
- C. Remove excess topsoil not intended for reuse, from site.

3.4 SUBSOIL EXCAVATION

- A. Excavate subsoil from areas to be excavated or graded as identified on the plans.
- B. Do not excavate wet subsoil or excavate and process wet material to obtain optimum moisture content.
- C. Remove excess subsoil from site.
- D. Stability: Replace damaged or displaced subsoil to same requirements as for specified fill.
- E. If archaeological materials or human remains are discovered at any point in the excavation, follow the Unanticipated Discovery Plan (UDP) included with these specifications.

3.5 FILLING

- A. Install work in accordance with the latest edition of WSDOT Standard Specifications.
- B. Fill areas to contours and elevations with unfrozen materials.
- C. Place fill material by means of heavy equipment compactors in continuous layers not exceeding a thickness of 6" per lift and compact. In areas where hand operated mechanical compactors are used, place material in continuous layers not exceeding 4" per lift and compact. Layers shall be compacted to a dense state equaling at least 95 percent of the maximum dry density, using the modified proctor, per ASTM D1557
- D. Maintain optimum moisture content of fill materials to attain required compaction density.
- E. Make grade changes gradual. Blend slope into level areas.
- F. Surplus materials are to be removed from the site and disposed of at a proper disposal site.

3.6 TOLERANCES

- A. Top Surface of Subgrade: Plus, or minus 1/10 foot from required elevation.

3.7 FIELD QUALITY CONTROL

- A. Testing: In accordance with ASTM D1557 and ASTM D2922.
- B. If tests indicate Work does not meet specified requirements, remove work, replace and retest at no additional cost to the Owner.

END OF SECTION

SECTION 31 23 16 – EXCAVATION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Excavating for building pads, road, parking, and site structures.

1.2 RELATED SECTIONS

- A. Section 31 22 13 - Rough Grading.
- B. Section 31 23 23 - Fill.
- C. Section 31 23 17 - Trenching: Excavating for utility trenches.
- D. Section 31 23 18 - Rock Removal: Removal of rock during excavating.

1.3 FIELD MEASUREMENTS

- A. Verify that survey benchmark and intended elevations for the Work are as indicated.

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION

3.1 PREPERATION

- A. Call Local Utility Line Information service at 811 not less than 48 hours before performing Work.
- B. Identify required lines, levels, contours, and datum locations.
- C. Construction staking is to be performed or directly supervised by a Professional Land Surveyor licensed in the State of Washington.
- D. Protect plant life, lawns and other features remaining as portion of the final landscaping.

3.2 EXCAVATION

- A. Perform excavation for structures in conformance with WSDOT Section 2-09.
- B. If excavation interferes with 45 degree bearing splay of existing foundation, or if required by geotechnical engineer's recommendations, the Contractor shall underpin adjacent structures which may be damaged by excavation work.
- C. Excavate subsoil to grades indicated.
- D. Compact disturbed load bearing soil in direct contact with base rocks to original bearing capacity; perform compaction in accordance with Section 31 22 13.
- E. Slope banks with machine to angle of repose or less until shored. Temporary shoring of excavations is the responsibility of the Contractor. The Contractor shall be responsible for means, methods, and design of any and all temporary shoring required or determined to be required by the Contractor. Excavation is to be performed per the Washington State Department of Labor & Industries requirements.
- F. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- G. Hand trim excavation. Remove loose matter.
- H. Remove lumped subsoil, boulders, and rock up to 1/3 cu yd measured by volume. Larger material will be removed under Section 31 23 18.
- I. Notify Engineer of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.
- J. Correct areas over excavated in accordance with Section 31 22 13.
- K. Comply with geotechnical report recommendations.

3.3 FIELD QUALITY CONTROL

- A. Allow for Owner provided Testing Agency to observe excavations.

3.4 PROTECTION

- A. Prevent displacement or loose soil from falling into excavation; maintain soil stability.
- B. Protect bottom of excavations and soil adjacent to excavation from freezing.
- C. Protect structures, utilities and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth operations.

END OF SECTION



UNANTICIPATED DISCOVERY OF CULTURAL RESOURCES AND HUMAN SKELETAL REMAINS

Project Name: Pacific Building Project

Address/Location: 4459 SE Mile Hill Dr., Port Orchard, Washington 98366

County: Kitsap

Project Lead/Organization: Kitsap County

1. INTRODUCTION

The following Unanticipated Discovery Plan (UDP) outlines procedures to follow, in accordance with state and federal laws, if archaeological materials or human remains are discovered. Once completed, the UDP shall be kept at the project site during all project activities. All staff, contractors, and volunteers shall be familiar with its contents and know where to find it.

2. CULTURAL RESOURCE DISCOVERIES

A cultural resource discovery could be prehistoric or historic artifacts. Examples include:

- An accumulation of shell, burned rocks, or other food related materials.
- Bones, intact or in small pieces.
- An area of charcoal or very dark stained soil with artifacts.
- Stone tools or waste flakes (for example, an arrowhead or stone chips).
- Modified or stripped trees, often cedar or aspen, or other modified natural features, such as rock drawings.
- Agricultural or logging materials that appear older than 50 years. These could include equipment, fencing, canals, spillways, chutes, derelict sawmills, tools, and many other items.
- Clusters of tin cans or bottles, or other debris that appear older than 50 years.
- Old munitions casings. *Always assume these are live and never touch or move.*
- Buried railroad tracks, decking, foundations, or other industrial materials.
- Remnants of homesteading. These could include bricks, nails, household items, toys, food containers, and other items associated with homes or farming sites.

The above list does not cover every possible cultural resource. When in doubt, assume the material is a cultural resource.

3. ON-SITE RESPONSIBILITIES

If any employee, contractor, or subcontractor believes that they have uncovered cultural resources or human remains at any point in the project, take the following steps to ***Stop-Protect-Notify***. **If you suspect that the discovery includes human remains, also follow Sections 5 and 6.**

STEP 1: Stop Work.

All work must stop immediately in the vicinity of the discovery.

STEP 2: Protect the discovery.

Leave the discovery and the surrounding area untouched and create a clear, identifiable, and wide boundary (30 feet or larger) with temporary fencing, flagging, stakes, or other clear markings. Provide protection and ensure integrity of the discovery until cleared by the Department of Archaeological and Historical Preservation (DAHP) or a licensed, professional archaeologist.

Do not permit vehicles, equipment, or unauthorized personnel to traverse the discovery site. Do not allow work to resume within the boundary until the requirements of this IDP are met.

STEP 3: Notify Project Manager and Kitsap County Block Grant Office

Project Contacts

Primary Contact

Name: Judy-Rae Karlsen
Organization: Kitsap County
Phone: 360-728-6444
Email: jrkarlsen@kitsap.gov

Alternate Contact

Name:
Organization:
Phone:
Email:

Kitsap County Block Grant Contacts

Primary

Name: Shannon Bauman
Phone: 360-552-5288
Email: sbauman@kitsap.gov

Alternate

Name: Bonnie Tufts
Phone: 360-552-8709
Email: btufts@kitsap.gov

STEP 4: The Block Grant Office will notify DAHP.

Once notified, the Kitsap County Block Grant Office will contact Washington State Dept. of Archeology and Historic Preservation (DAHP) to report and confirm the discovery. To avoid delay, the Project Lead/Organization will contact DAHP if they are not able to reach Kitsap County Block Grant staff.

DAHP will provide the steps to assist with identification. DAHP, Kitsap County Block Grant, and Tribal representatives may coordinate a site visit following any necessary safety protocols. DAHP may also inform the Project Lead/Organization and Kitsap County Block Grant of additional steps to further protect the site.

Do not continue work until DAHP has issued an approval for work to proceed in the area of, or near, the discovery.

DAHP Contacts:

Name: Rob Whitlam, PhD
Title: State Archaeologist
Cell: 360-890-2615
Email: Rob.Whitlam@dahp.wa.gov
Main Office: 360-586-3065

Human Remains/Bones:

Name: Guy Tasa, PhD
Title: State Anthropologist
Cell: 360-790-1633 (24/7)
Email: Guy.Tasa@dahp.wa.gov

In the event cultural resources are discovered, the following tribes will be contacted.

Tribal Contacts:

Tribe: Port Gamble S'Klallam
Contact: Stormy Purser
Title: Tribal Historic Preservation Officer
Email: thpo@pgst.nsn.us

Tribe: Suquamish
Contact: Dennis E. Lewarch
Title: Tribal Historic Preservation Officer
Email: dlewarch@suquamish.nsn.us

Tribe: Skokomish
Contact: Kris Miller
Title: Tribal Historic Preservation Officer
Email: shlanay1@skokomish.org

4. SPECIAL PROCEDURES FOR THE DISCOVERY OF HUMAN SKELETAL MATERIAL

Any human skeletal remains, regardless of antiquity or ethnic origin, will at all times be treated with dignity and respect. Follow the steps under Stop-Protect-Notify. For specific instructions on how to handle a human remains discovery, see: RCW 68.50.645: Skeletal human remains—Duty to notify—Ground disturbing activities—Coroner determination—Definitions.

Suggestion: If you are unsure whether the discovery is human bone or not, contact Guy Tasa with DAHP, for identification and next steps. Do not pick up the discovery.

Guy Tasa, PhD State Physical Anthropologist
Guy.Tasa@dahp.wa.gov
(360) 790-1633 (Cell/Office)

For discoveries that are confirmed or suspected human remains, follow these steps:

1. Notify law enforcement and the Medical Examiner/Coroner using the contacts below. Do not call 911 unless it is the only number available to you.

- Kitsap County Coroner, 360-337-7077
- Kitsap County Sheriff's Office, 360-337-7101

2. The Medical Examiner/Coroner (with assistance of law enforcement personnel) will determine if the remains are human or if the discovery site constitutes a crime scene and will notify DAHP.

3. DO NOT speak with the media, allow photography or disturbance of the remains, or release any information about the discovery on social media.

4. If the remains are determined to be non-forensic, cover the remains with a tarp or other materials (not soil or rocks) for temporary protection and to shield them from being photographed by others or disturbed.

Further activities:

- Per RCW 27.44.055, RCW 68.50, and RCW 68.60, DAHP will have jurisdiction over non-forensic human remains. Kitsap County staff will participate in consultation. The Project Lead/Organization may also participate in consultation.
- Documentation of human skeletal remains and funerary objects will be agreed upon through the consultation process described in RCW 27.44.055, RCW 68.50, and RCW 68.60.
- When consultation and documentation activities are complete, work in the discovery area may resume as described in Section 8.

If the project occurs on federal lands (such as a national forest or park or a military reservation) the provisions of the Native American Graves Protection and Repatriation Act of

1990 (NAGPRA) apply and the responsible federal agency will follow its provisions. Note that state highways that cross federal lands are on an easement and are not owned by the state.

If the project occurs on non-federal lands, the Project Lead/Organization will comply with applicable state and federal laws, and the above protocol.

5. DOCUMENTATION OF ARCHAEOLOGICAL MATERIALS

Archaeological deposits discovered during construction will be assumed eligible for inclusion in the National Register of Historic Places under Criterion D until a formal Determination of Eligibility is made.

Cultural Resources Program staff will ensure the proper documentation and assessment of any discovered cultural resources in cooperation with the federal agencies (if any), DAHP, affected tribes, and a contracted consultant (if any).

All prehistoric and historic cultural material discovered during project construction will be recorded by a professional archaeologist on State of Washington cultural resource site or isolate form using standard techniques. Site overviews, features, and artifacts will be photographed; stratigraphic profiles and soil/sediment descriptions will be prepared for subsurface exposures. Discovery locations will be documented on scaled site plans and site location maps.

Cultural features, horizons and artifacts detected in buried sediments may require further evaluation using hand-dug test units. Units may be dug in controlled fashion to expose features, collect samples from undisturbed contexts, or interpret complex stratigraphy. A test excavation unit or small trench might also be used to determine if an intact occupation surface is present. Test units will be used only when necessary to gather information on the nature, extent, and integrity of subsurface cultural deposits to evaluate the site's significance. Excavations will be conducted using state-of-the-art techniques for controlling provenience.

Spatial information, depth of excavation levels, natural and cultural stratigraphy, presence or absence of cultural material, and depth to sterile soil, regolith, or bedrock will be recorded for each probe on a standard form. Test excavation units will be recorded on unit-level forms, which include plan maps for each excavated level, and material type, number, and vertical provenience (depth below surface and stratum association where applicable) for all artifacts recovered from the level. A stratigraphic profile will be drawn for at least one wall of each test excavation unit.

Sediments excavated for purposes of cultural resources investigation will be screened through 1/8-inch mesh, unless soil conditions warrant 1/4-inch mesh.

All prehistoric and historic artifacts collected from the surface and from probes and excavation units will be analyzed, catalogued, and temporarily curated. Ultimate disposition of cultural materials will be determined in consultation with the federal agencies (if any), DAHP, and the affected tribes.

Within 90 days of concluding fieldwork, a technical report describing any and all monitoring and resultant archaeological excavations will be provided to the Project Manager, who will forward the report to the City of Arlington for review and delivery to the federal agencies (if any), SHPO, and the affected tribe(s).

If assessment activity exposes human remains (burials, isolated teeth, or bones), the process described in Section 5 above will be followed.

6. PROCEEDING WITH WORK

The Project Lead/Organization shall work with the archaeologist, DAHP, and affected tribe(s) to determine the appropriate discovery boundary and where work can continue.

Work may continue at the discovery location only after the process outlined in this plan is followed and the Project Lead/Organization, DAHP, any affected tribe(s), Ecology, and the federal agencies (if any) determine that compliance with state and federal laws is complete.

SECTION 31 23 16 – TRENCHING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Excavating trenches for utilities. This includes, but is not limited to: stormwater, sanitary sewer, water, power, phone, cable, and fiber optic.
- B. Compacted fill from top of utility bedding to subgrade elevations.
- C. Backfilling and compaction.

1.2 RELATED SECTIONS

- A. Section 32 05 16 - Aggregate Materials.
- B. Section 31 22 13 - Rough Grading:
- C. Section 31 23 16 - Excavation.
- D. Section 31 23 23 - Fill
- E. Section 31 23 18 - Rock Removal: Removal of rock during excavating.
- F. Section 31 37 00 – Riprap.
- G. Section 33 11 16 - Site Water Distribution.
- H. Section 33 41 00 - Site Storm Sewerage Systems: Storm sewer piping and bedding
- I. Section 33 31 00 – Sanitary Sewage Systems. Sanitary sewer piping and bedding.

1.3 REFERENCES

- A. ASTM D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.
- B. ASTM D2922 Standard Test Method for Density of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depth).

1.4 DEFINITIONS

- A. Utility: Any buried pipe, duct, conduit, or cable.

1.5 FIELD MEASUREMENTS

- A. Verify that survey benchmark, control point, and intended elevations for the Work are as shown on drawings.
- B. Construction staking is to be performed or directly supervised by a Professional Land Surveyor licensed in the State of Washington.

PART 2 PRODUCTS

2.1 FILL MATERIALS

- A. Fill: As specified in Section 31 23 23.
- B. Pipe Bedding: As specified in Section 32 05 16.

PART 3 EXECUTION

3.1 PREPERATION

- A. Identify required lines, levels, contours, and datum locations.
- B. Protect trees, plant life, and other features called out to remain.
- C. Protect bench marks, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.
- D. Maintain and protect above and below grade utilities which are to remain.
- E. Cut out soft areas of subgrade not capable of compaction in place. Backfill and compact to density equal to or greater than requirements for subsequent backfill material.

3.2 EXCAVATING

- A. Excavate subsoil required for: catch basins, storm drainage conveyance piping, infiltration facility, water distribution lines, and fittings; sanitary sewer lines, manholes; and other utilities indicated on the drawings.
- B. Cut trenches sufficiently wide to enable installation and allow inspection. Remove water or materials that interfere with work. Provide shoring as required to comply with Department of

Labor and Industries requirements. Contractor is responsible for design of shoring means and methods.

- C. Do not interfere with 45 degree bearing splay of foundations.
- D. Hand trim excavation. Hand trim for bell and spigot pipe joints. Remove loose matter.
- E. Remove lumped subsoil, boulders, and rock up to 1/3 cu yd by volume. Larger material will be removed under Section 31 23 18.
- F. Correct areas over excavated.

3.3 BACKFILLING

- A. Backfill trenches to contours and elevations with unfrozen fill materials.
- B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.
- C. Place and compact materials in equal continuous layers not exceeding 6 inches compacted depth.
- D. Employ a placement method that does not disturb or damage utilities in trench, or adjacent structures.
- E. Maintain optimum moisture content of fill materials to attain required compaction density.
- F. Remove surplus fill materials from site.
- G. Utility trenches within the Right-of-Way, must backfill the top 4.0 feet of the trench with crushed surfacing top course. Material is to be compacted to 95% compaction.
- H. Joint trench for power, phone, cable, and gas is to be shaded with 6" of sand. Contractor is to coordinate their trenching activities with the utility providers. The contractor is to schedule the utility provider installation prior to trench backfill.

3.4 TOLERANCES

- A. Top Surface of General Backfilling: Plus, or minus 1/10 foot from the required elevations.

3.5 FIELD QUALITY CONTROL

- A. Compaction testing will be performed by Owner provided testing agency in accordance with ASTM D1557 and ASTM D2922.
- B. If tests indicate Work does not meet specified requirements, remove work, replace, compact, and retest at no additional cost to the Owner.

3.6 PROTECTION OF FINISHED WORK

- A. Protect finished Work.
- B. Reshape and re-compact fills subjected to vehicular traffic during construction.

END OF SECTION

SECTION 31 23 18 - ROCK REMOVAL

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Removal of rock discovered during excavation.
- B. Expansive tools to assist rock removal.

1.2 RELATED SECTIONS

- A. Section 31 22 13 - Rough Grading.
- B. Section 31 23 16 - Excavation:
- C. Section 31 23 23 - Backfilling:
- D. Section 31 23 17 - Trenching: Trenching and backfilling for utilities.
- E. Section 31 37 00 - Riprap.

1.3 DEFINITIONS

- A. Site Rock: Solid mineral material with a volume in excess of 1/6 cu yd or solid material that cannot be removed with a 3/4 cu yd capacity power shovel without drilling or blasting.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Mechanical Disintegration Compound.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify site conditions prior to the commencement of operations.
- B. Verify site conditions and note subsurface irregularities affecting work of this section.

3.2 PREPARATION

- A. Identify required lines, levels, contours, and datum.

3.3 ROCK REMOVAL BY A MECHANICAL METHOD

- A. Excavate and remove rock by the mechanical method.
- B. Drill holes and utilize expansive tools, wedges, or mechanical disintegration compound to fracture rock.
- C. Cut away rock at bottom of excavation to form level bearing.
- D. In utility trenches, excavate to 6 inches below invert elevation of pipe and 24 inches wider than pipe diameter.
- E. Remove excavated materials from site.
- F. Correct unauthorized rock removal in accordance with Section 31 23 23.

3.4 FIELD QUALITY CONTROL

- A. Provide for visual inspection of foundation bearing surfaces and cavities formed by removed rock.

END OF SECTION

SECTION 31 23 23 - FILL

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Site filling and backfilling.
- B. Consolidation and Compaction (embankment compaction).

1.2 RELATED SECTIONS

- A. Section 32 05 16 - Aggregate Materials.
- B. Section 31 22 13 - Rough Grading.
- C. Section 31 23 16 - Excavation.
- D. Section 31 23 17 - Trenching: Backfilling of utility trenches.
- E. Section 31 37 00 - Riprap

1.3 REFERENCES

- A. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.
- B. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

PART 2 PRODUCTS

2.1 FILL MATERIALS

- A. Quarry Spalls: As specified in Section 32 05 16.
- B. Select Borrow: As specified in Section 32 05 16.
- C. Gravel Ballast: As specified in Section 32 05 16

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify sub-drainage installation has been inspected.
- B. Verify structural ability of unsupported walls to support imposed loads by the fill.

3.2 PREPARATION

- A. Compact subgrade to density requirements for subsequent backfill materials.
- B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with structural fill and compact to 95% maximum dry density per paragraph 3.3 below.

3.3 BACKFILLING

- A. Backfill areas to contours and elevations with unfrozen materials.
- B. Place fill material by means of heavy equipment compactors in continuous layers not exceeding a thickness of 6" per lift and compact. In areas where hand operated mechanical compactors are used, place material in continuous layers not exceeding 4" per lift and compact. Layers shall be compacted to a dense state equaling at least 95 percent of the maximum dry density, using the modified proctor, per ASTM D1557.
- C. Maintain optimum moisture content of backfill materials to attain required compaction density.
- D. Make gradual grade changes. Blend slope into level areas.
- E. Native material is to be used as backfill, except where noted otherwise.

3.4 TOLERANCES

- A. Top Surface of Backfilling, plus or minus 0.10 foot (1/10 of a foot) from required elevations.

3.5 FIELD QUALITY CONTROL

- A. Compaction testing will be performed in accordance with ASTM D1557 and ASTM D2922.
- B. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no additional cost to the Owner.

3.6 PROTECTION OF FINISHED WORK

- A. Protect finished Work.
- B. Reshape and re-compact fills subjected to vehicular traffic.

END OF SECTION

SECTION 31 25 00 - EROSION AND SEDIMENTATION CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES:

- A. Diversion Channels.
- B. Rock Basin.
- C. Rock Barriers.
- D. Sediment Ponds.
- E. Sediment Traps.
- F. Inlet Protection.
- G. Filter Fabric Fence.

1.2 RELATED SECTIONS:

- A. Section 31 05 13 - Soils for Earthwork.
- B. Section 31 05 16 - Aggregates for Earthwork.
- C. Section 31 10 00 - Site Clearing.
- D. Section 31 23 16 - Excavation.
- E. Section 31 23 23 - Fill.
- F. Section 31 37 00 - Riprap.

1.3 REFERENCES

- A. ASTM C127 - Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate.
- B. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
- C. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

1.4 SUBMITTALS

- A. Product Data: Submit data on geotextile.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with the latest edition of the Washington State Standard Specifications for Road, Bridge and Municipal Construction.

1.6 PRE-INSTALLATION MEETINGS

- A. Convene minimum one week prior to commencing work of this section.

PART 2 PRODUCTS

2.1 ROCK AND GEOTEXTILE MATERIALS

- A. Furnish materials in accordance with the latest edition of the Washington State Standard Specifications for Road, Bridge and Municipal Construction.
- B. Quarry Spalls: Granite type; irregular shaped rock; solid and nonfriable; 4-inch minimum size, 8-inch maximum size.
- C. Filter Fabric Geotextile: Furnish in accordance with the latest edition of the Washington State Standard Specifications for Road, Bridge and Municipal Construction.

2.2 BLOCK, STONE, AGGREGATE, AND SOIL MATERIALS

- A. Precast Solid Concrete Block: Furnish in accordance with the latest edition of the Washington State Standard Specifications for Road, Bridge and Municipal Construction.
- B. Stone: Furnish in accordance with the latest edition of the Washington State Standard Specifications for Road, Bridge and Municipal Construction.
- C. Coarse Aggregate: As specified in Section 32 05 16.
- D. Washed Gravel Backfill: 3/4" minimum to 1 1/2" maximum washed free of fines. per plans or see WDOT 9-03.12(5).

2.3 PLANTING MATERIALS

- A. Seeding and Soil Supplements: As Specified on TESC Plan Sheet
- B. Mulching Material: Composted, shredded hardwood bark, dark brown in color. OR Oat or wheat straw, free from weeds, foreign matter detrimental to plant life, and dry. Hay or chopped cornstalks are not acceptable.

2.4 PIPE MATERIALS

- A. Pipe: Plastic, as specified in Section 33 41 00.

2.5 ACCESSORIES

- A. Trash Rack: Furnish in accordance with WSDOT Standard Plans.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verification of existing conditions before starting work.
- B. Verify compacted subgrade is acceptable and ready to support devices and imposed loads.
- C. Verify gradients and elevations of base or foundation for other work are correct.

3.2 DIVERSION CHANNELS

- A. Windrow excavated material on low side of channel.
- B. Compact to 95 percent maximum density.
- C. On entire channel area, apply soil supplements and temporary seed as specified on TESC Plan Sheet.
- D. Install Work in accordance with the latest edition of the Washington State Standard Specifications for Road, Bridge and Municipal Construction.

3.3 ROCK ENERGY DISSIPATOR

- A. Excavate to indicated depth of rock lining or 12" nominal placement thickness. Remove loose, unsuitable material below bottom of rock lining, then replace with suitable material. Thoroughly compact and finish entire foundation area to firm, even surface.
- B. Lay and overlay geotextile fabric over substrate. Lay fabric parallel to flow from upstream to downstream. Overlap edges upstream over downstream and upslope over downslope. Provide a minimum overlap of 3 feet. Offset adjacent roll ends a minimum of 5 feet when lapped. Cover fabric as soon as possible and in no case leave fabric exposed more than 4 weeks.
- C. Carefully place rock on geotextile fabric to produce an even distribution of pieces, with minimum of voids and without tearing geotextile.
- D. Unless indicated otherwise, place full course thickness in one operation to prevent segregation and to avoid displacement of underlying material. Arrange individual rocks for uniform distribution.

3.4 ROCK BARRIER

- A. Install Work in accordance with the latest edition of the Washington State Standard Specifications for Road, Bridge and Municipal Construction.

3.5 SEDIMENTATION POND

- A. Clear and grub storage area and embankment foundation area site as specified in Section 31 10 00.
- B. Excavate key trench for full length of dam. Excavate emergency spillway in natural ground.
- C. Install pipe spillway, with anti-seep collar attached, at location indicated.
- D. Place forms, and reinforcing for concrete footing at bottom of riser pipe with trash rack and anti-vortex device, as specified in Section 03 10 00, and Section 03 20 00. Construction of embankment and trench prior to placing pipe is not required.
- E. Do not use coarse aggregate as backfill material around pipe. Backfill pipe with suitable embankment material to prevent dam leakage along pipe.

- F. Construct rock basin at outlet end of pipe, as specified in this Section. Place embankment material, as specified in Section 31 23 23. When required, obtain borrow excavation for formation of embankment, as specified in Section 31 23 23.
 - G. On entire sedimentation pond area, apply soil supplements and sow seed as specified in Section 32 92 19.
 - H. Mulch seeded areas with hay.
- 3.6 SEDIMENT TRAPS
- A. Clear site, as specified in Section 31 10 00.
 - B. Construct trap by excavating and forming embankments.
 - C. Place coarse aggregate or rock at outlet as indicated on Drawings.
 - D. Place geotextile fabric, as specified for rock energy dissipator.
 - E. When required, obtain borrow excavation for formation of embankment, as specified in Section 31 23 16.
 - F. On entire sediment trap area, apply soil supplements and sow seed as specified in Section 32 92 19.
 - G. Mulch seeded areas.
- 3.7 INLET PROTECTION
- A. Inlet protection devices shall be installed as noted on the TESC plans.
 - B. Maintenance of Inlet Protection shall be in accordance with the latest edition of the Washington State Standard Specifications for Road, Bridge and Municipal Construction.
- 3.8 FILTER FABRIC FENCE
- A. Fabric shall be backed with steel wire and attached with metal rings to steel posts. Typical Fence details are noted on the TESC Plan Sheet.
 - B. Installation shall be as located on the TESC Plan Sheet as a minimum. Site characteristics may require additional linear feet of filter fabric fence.
- 3.9 SITE STABILIZATION
- A. Incorporate erosion control devices indicated on the Drawings into the Project at the earliest practicable time.
 - B. Construct, stabilize and activate erosion controls before site disturbance within tributary areas of those controls.
 - C. Stockpile and waste pile heights shall not exceed 30 feet. Slope stockpile sides at 2: 1 or flatter.
 - D. Stabilize any disturbed area of affected erosion control devices on which activity has ceased and which will remain exposed for more than 20 days.
 - E. Stabilize disturbed areas which are not at finished grade and which will be disturbed within one year in accordance with temporary seeding specification as noted on TESC Plan Sheet.
 - F. Stabilize disturbed areas which are either at finished grade or will not be disturbed within one year in accordance with permanent seeding specifications noted on TESC Plan Sheet.
 - G. Stabilize diversion channels, sediment traps, and stockpiles immediately.
- 3.10 FIELD QUALITY CONTROL
- A. Inspect erosion control devices on a weekly basis and after each runoff event. Make necessary repairs to ensure erosion and sediment controls are in good working order.
- 3.11 CLEANING
- A. When sediment accumulation in sedimentation structures has reached a point one-third depth of sediment structure or device, remove and dispose of sediment.
 - B. Do not damage structure or device during cleaning operations.
 - C. Do not permit sediment to erode into construction or site areas or natural waterways.
 - D. Clean channels when depth of sediment reaches approximately one-half channel depth.

3.12 PROTECTION

- A. Immediately after placement, protect paving from premature drying, excessive hot or cold temperatures, and mechanical injury.
- B. Do not permit construction traffic over paving for 7 days minimum after finishing.
- C. Protect paving from elements, flowing water, or other disturbance until curing is completed.

END OF SECTION

SECTION 32 00 00 - SITE IMPROVEMENTS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to work of this section.
- B. Refer to Section 31 10 00, Site Preparation.
- C. Refer to Section 31 20 00, Earthwork.
- D. Refer to Section 32 13 00, Concrete Paving.

1.02 DESCRIPTION OF WORK

- A. Provide and install site furnishings and other site improvements as specified and shown on the drawings.
- B. Provide Owner with completed facilities ready to use for standard and planned activities.
- C. All work to conform to recommendations and guidelines of all applicable manufacturers, installers and users associations, et al.

1.03 COLORS

- A. As noted, or to be as selected by Architect from manufacturer's complete line.

1.04 SUBMITTALS

- A. Submit catalog cut sheets for all specified items and detailed shop drawings for all items requiring fabrication.

PART 2 PRODUCTS

2.01 PLAYGROUND BORDERS AT PLAY AREA AND DOG PARK AREA

- A. Playground Borders – Plastic with metal spikes. APS-Border12. Install per manufacturer's recommendations, or approved substitution
- B. Color: Black
- C. Dimensions: 4'-4" x 12"
- D. Contact: Action Play Systems 855-752-9277

PART 3 EXECUTION

3.01 GENERAL

- A. Refer to applicable details and plans for layout and installation.
- B. Install rigid, plumb and true to lines and levels shown. Stake out all elements called for in this section for approval by Owner or authorized representative. All work of highest quality.
- C. Unless otherwise indicated, install all equipment specified by name/manufacturer as per manufacturer's recommendations; submit installation procedure to Owner or authorized representative for approval prior to installation.
- D. Upon receipt of all products, inspect thoroughly to ensure that all parts were received and in good condition. Return and replace if there are any defects.
- E. Store all products in a dry location, away from possible damage until time of installation

END OF SECTION

SECTION 32 05 16 - AGGREGATE MATERIALS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Aggregate materials.

1.2 RELATED SECTIONS

- A. Section 31 22 13 - Rough Grading.
- B. Section 31 23 23 - Fill.
- C. Section 31 23 17 - Trenching.
- D. Section 31 37 00 - Riprap.
- E. Section 33 11 16 - Site Water Distribution
- F. Section 33 41 00 - Site Storm Sewerage Systems.

1.3 REFERENCES

- A. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.
- B. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- C. AASHTO - M147 - Materials for Aggregate and Soil-Aggregate.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with WSDOT Plans and Specifications, latest edition.

PART 2 PRODUCTS

2.1 AGGREGATE MATERIALS

- A. Trench backfill: Conforming to WSDOT 9-03.19, Bank Run Gravel for Trench Backfill, except only 5% (max) is allowed to pass the U.S. No 200 sieve.
- B. Pipe Bedding Backfill (Rigid): Conforming to WSDOT 9-03.12(3), Bedding Material for Rigid Pipe.
- C. Pipe Bedding Backfill (Flexible): Conforming to WSDOT 9-03.12(3), Bedding for Flexible Pipe.
- D. Gravel Base: Conforming to WSDOT 9-03.10, except only 5% (max) is allowed to pass the U.S. No 200 sieve.
- E. Crushed Rock/Aggregate Top Course: Conforming to WSDOT 9-03.9(3), Crushed Surfacing.
- F. Spalls: Conforming to WSDOT 9-13.7(2) for backfill behind rock wall.
- G. Retaining Wall Rock: Solid rock conforming to WSDOT 9-13.7, size as specified in Rock Wall Detail as shown on the plans.
- H. Gravel Backfill for Drains: Conforming to WSDOT 9-03.12(4).
- I. Select Borrow: Conforming to WSDOT 9-03.14(2).
- J. Sand: Conforming to WSDOT 9-03.13(1).
- K. Structural Fill: Native material as allowed by the geotechnical engineer, otherwise conforming to WSDOT 9-03.10.
- L. Gravel Ballast: Conforming to WSDOT 9-03.9(1)

2.2 SOURCE QUALITY CONTROL

- A. Coarse Aggregate Material - Testing and Analysis: Perform in accordance with ASTM D1557 and ASTM D2922.
- B. If tests indicate materials do not meet specified requirements, change material or material source and retest. Perform work at no additional cost to the Owner.
- C. Provide materials of each type from same source throughout the Work.

PART 3 EXECUTION

3.1 STOCKPILING

- A. The contractor is to monitor the stockpile and replenish as required to meet project schedule and to avoid impacting adjacent properties.
- B. Separate differing materials with dividers or stockpile apart to prevent mixing.

- C. Direct surface water away from stockpile site so as to prevent erosion or deterioration of materials.

3.2 STOCKPILE CLEANUP

- A. Remove stockpile, leave area in a clean and neat condition. Grade site surface to prevent free standing surface water.

END OF SECTION

SECTION 32 11 23 - AGGREGATE BASE AND TOP COURSE

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Aggregate base course.
- B. Aggregate top course.

1.2 RELATED SECTIONS

- A. Section 32 05 16 - Aggregate Materials.
- B. Section 31 22 13 - Rough Grading: Preparation of site for base course.
- C. Section 31 23 23 - Fill: Compacted fill under base course.
- D. Section 31 23 17 - Trenching: Compacted fill under base course.
- E. Section 32 12 16 - Asphalt Paving: Finish asphalt courses.

1.3 REFERENCES

- A. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.
- B. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

PART 2 PRODUCTS

2.1 MATERIALS

- A. Aggregate Base Course: (Gravel Base) as specified in Section 32 05 16.
- B. Aggregate Top Course: As specified in Section 32 05 16.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify substrate has been inspected, gradients and elevations are correct, and is dry.

3.2 PREPARATION

- A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.
- B. Do not place fill on soft, muddy, or frozen surfaces.

3.3 AGGREGATE PLACEMENT

- A. Perform work within this Section in conformance with WSDOT Section 4-04.
- B. Uniformly spread aggregate over prepared substrate to a total compacted thickness for base course and top course as indicated on the plans.
- C. Place aggregate in maximum 6-inch layers and compact to specified density.
- D. Level and contour surfaces to elevations and gradients indicated.
- E. Add small quantities of fine aggregate to coarse aggregate as appropriate to assist compaction.
- F. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.
- G. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.4 TOLERANCES

- A. Flatness: Maximum variation of 1/4 inch measured with 10-foot straight edge.
- B. Scheduled Compacted Thickness: Within 1/4 inch.
- C. Variation From Design Elevation: Within 1/2 inch.

3.5 FIELD QUALITY CONTROL

- A. Compaction testing will be performed by Owner provided testing agency in accordance with ASTM D1557 and ASTM D2922.
- B. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no additional cost to the Owner.

END OF SECTION

SECTION 32 12 16 - ASPHALT PAVING

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes asphaltic concrete paving and patching.

1.2 RELATED SECTIONS

- A. Section 32 05 16 - Aggregate: Product requirements for aggregate for placement by this section.
- B. Section 31 22 13 - Rough Grading: Preparation of site for paving and base.
- C. Section 33 41 00 - Site Storm Sewerage Systems.
- D. Section 32 11 23 - Aggregate Base and Top Course: Compacted sub base for paving.

1.3 REFERENCES

- A. ASTM D946 - Penetration-Graded Asphalt Cement for Use in Pavement Construction.
- B. WSDOT Section 5-04, Hot Mix Asphalt.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with WSDOT requirements Section 5-04
- B. Obtain materials from same source throughout.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Place asphalt in accordance with weather limitations detailed in WSDOT Section 5-04.3(16).
- B. Place bitumen mixture when temperature is not more than 15 degrees F below bitumen supplier's bill of lading and not more than maximum specified temperature.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Asphalt Concrete: Paving asphalt HMA Class 1/2 PG 58-22 conforming to WSDOT 9-02.1(4).
- B. Tack Coat: Diluted emulsified asphalt. In accordance with WSDOT 9-02.1(6), Type CSS-1 or STE-1.

2.2 SOURCE QUALITY CONTROL AND TESTS

- A. Submit proposed mix design of each class of mix for review prior to beginning of Work.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify compacted subgrade is dry and ready to support paving and imposed loads.
- B. Verify gradients and elevations of base are correct.
- C. Do not install or start work until unsatisfactory conditions have been corrected. Beginning of work constitutes Contractor's acceptance of conditions as satisfactory.

3.2 PREPARATION

- A. Construction shall conform to details, dimensions, and grades specified.
- B. All areas to be paved shall be graded and compacted in accordance with Section 312213.
- C. Use clean sand to blot excess primer.
- D. Apply tack coat in accordance with WSDOT specifications.
- E. Apply tack coat to contact surfaces of curbs and gutters.
- F. Coat surfaces of manhole, catch basin, and other utility structures covers/frames with oil to prevent bond with asphalt pavement. Do not tack coat these surfaces.

3.3 PLACING ASPHALT PAVEMENT

- A. Placement of asphalt concrete pavement shall be accordance with WSDOT 5-04.
- B. Place wearing course to 3-inch compacted thickness.
- C. Install catch basins and manhole frames and grates in correct position and elevation.
- D. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.

- E. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.
 - F. Spreading, finishing, and compacting shall be in accordance with WSDOT Sections 5-04.3(9) and 5-04.3(10).
 - G. Joints shall be constructed in accordance with WSDOT Section 5-04.3(11).
 - H. After completion of paving operations, clean surfaces or excess or spilled asphaltic materials, including all adjoining concrete sidewalks and flatwork.
- 3.4 CURBS
- A. Install thickened edge asphalt curbs as indicated on Drawings.
- 3.5 TOLERANCES
- A. Surface Smoothness must conform to WSDOT Section 5-04.3(13).
- 3.6 FIELD QUALITY CONTROL
- A. The Owner provided Testing Laboratory will perform field inspection and testing in accordance with WSDOT 5-04.3(10)B and 5-04.3(12).
- 3.7 PROTECTION OF FINISHED WORK
- A. Immediately after placement, protect pavement from mechanical injury for 12 hours or until surface temperature is less than 140 degrees F.

END OF SECTION

SECTION 32 17 23 - PAVEMENT MARKINGS

PART 1 GENERAL

- 1.1 SECTION INCLUDES
 - A. Traffic lines and markings.
 - B. Paint.
 - C. Glass beads.
- 1.2 RELATED REQUIREMENTS:
 - A. Section 32 12 16 - Asphalt Pavement.
- 1.3 REFERENCE STANDARDS
 - A. Washington State Department of Transportation - Standard Specifications for Road, Bridge, and Municipal Construction, M41.
- 1.4 SUBMITTALS
 - A. Test and Evaluation Reports: Submit source and acceptance test results in accordance with AASHTO M247.
 - B. Manufacturer's Instructions: Submit instructions for application temperatures, eradication requirements, application rate, line thickness, type of glass beads, bead embedment and bead application rate, and any other data on proper installation.
- 1.5 QUALITY ASSURANCE
 - A. Perform Work in accordance with the latest edition of Washington State Standard Specifications for Road, Bridge, and Municipal Construction.
- 1.6 QUALIFICATIONS
 - A. Applicator: Company specializing in performing work of this section with minimum 3 years' experience.
- 1.7 DELIVERY, STORAGE, AND HANDLING
 - A. Invert containers several days prior to use when paint has been stored more than 2 months. Minimize exposure to air when transferring paint. Seal drums and tanks when not in use.
 - B. Glass Beads. Store glass beads in cool, dry place. Protect from contamination by foreign substances.
- 1.8 AMBIENT CONDITIONS
 - A. Do not apply materials when surface and ambient temperatures are outside temperature ranges required by paint product manufacturer.
 - B. Do not apply exterior coatings during rain or snow when relative humidity is outside humidity ranges, or moisture content of surfaces exceed those required by paint product manufacturer.
 - C. Do not apply paint when temperatures are expected to fall below 50 degrees F for 24 hours after application.
 - D. Volatile Organic Content (VOC). Do not exceed State or Environmental Protection Agency maximum VOC on traffic paint.

PART 2 PRODUCTS

- 2.1 PAINTED PAVEMENT MARKINGS
 - A. Furnish materials in accordance with the latest edition of Standard Specifications for Road, Bridge and Municipal Construction Section 9-34.
- 2.2 EQUIPMENT
 - A. Continuous Longitudinal Line Application Machine: Use application equipment with following capabilities.
 - 1. Dual nozzle paint gun to simultaneously apply parallel lines of indicated width in solid or broken patterns or various combinations of those patterns.

2. Pressurized bead-gun to automatically dispense glass beads onto painted surface, at required application rate.
 3. Measuring device to automatically and continuously measure length of each line placed, to nearest foot.
- B. Machine Calibration:
1. Paint Line Measuring Device: Calibrate automatic line length gauges to maintain tolerance of plus or minus 25 feet per mile.
 2. Cycle Length/Paint Line Length Timer: Calibrate cycle length to maintain tolerance of plus or minus 6 inches per 40 feet; calibrate paint line length to maintain tolerance to plus or minus 3 inches per 10 feet.
 3. Paint Guns: Calibrate to simultaneously apply paint binder at uniform rates as specified with an allowable tolerance of plus or minus 1 mil.
 4. Bead Guns: Calibrate to dispense glass beads simultaneously at specified rate. Check guns by dispensing glass beads into gallon container for predetermined fixed period of time. Verify weight of glass beads.
- C. Other Equipment:
1. For application of crosswalks, intersections, stop lines, legends and other miscellaneous items by walk behind strippers, hand spray or stencil trucks, apply with equipment meeting requirements of this section. Do not use hand brushes or rollers. Optionally apply glass beads by hand.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not apply paint to concrete surfaces until concrete has cured for 28 days.
- B. Do not apply paint to HMA surfaces until pavement is cured or 21 days after placement.

3.2 PREPARATION

- A. Maintenance and Protection of Traffic:
1. Provide short term traffic control as required.
 2. Prevent interference with marking operations and to prevent traffic on newly applied markings before markings dry.
 3. Maintain travel lanes between 7:00 AM to 9: 00 AM, and between 4: 00 PM and 6: 00 PM.
 4. Maintain access to existing buildings and other properties requiring access.
- B. Surface Preparation:
1. Clean and dry paved surface prior to painting.
 2. Blow or sweep surface free of dirt, debris, oil, grease or gasoline.
 3. Spot location of final pavement markings as specified and as indicated on Drawings by applying pavement spots 25 feet on center.
 4. Notify Architect/Engineer after placing pavement spots and minimum 3 days prior to applying traffic lines.

3.3 DEMOLITION

- A. Remove existing markings in an acceptable manner. Do not remove existing pavement markings by painting over with blank paint. Remove by methods that will cause least damage to pavement structure or pavement surface. Satisfactorily repair any pavement or surface damage caused by removal methods.
- B. Clean and repair existing remaining or reinstalled lines and legends.

3.4 APPLICATION

- A. Install Work in accordance with the latest edition of Washington State Standard Specifications for Road, Bridge and Municipal Construction.

3.5 TOLERANCES

- A. Maximum Variation from Wet Film Thickness: 10%.
- B. Maximum Variation from Wet Paint Line Width: Plus, or minus 1/4 inch.
- C. Maintain cycle length for skip lines at tolerance of plus or minus 6 inches per 40 feet and line length of plus or minus 3 inches per 10 feet.
- D. Maximum Variation from Specified Application Temperature: Plus, or minus 5 degrees F.

3.6 FIELD QUALITY CONTROL

- A. Inspect for incorrect location, insufficient thickness, line width, coverage, retention, uncured or discolored material, and insufficient bonding.
- B. Repair lines and markings, which after application and curing do not meet following criteria:
 - 1. Incorrect Location: Remove and replace incorrectly placed patterns.
 - 2. Insufficient Thickness, Line Width, Paint Coverage, Glass Bead Coverage or Retention: Prepare defective material by acceptably grinding or blast cleaning to remove substantial amount of beads and to roughen marking surface. Remove loose particles and debris. Apply new markings on cleaned surface in accordance with this Section.
 - 3. Uncured or Discolored Material, Insufficient Bonding: Remove defective markings in accordance with this Section and clean pavement surface one foot beyond affected area. Apply new markings on cleaned surface in accordance with this Section.
- C. Replace defective pavement markings as specified throughout 1 year warranted period. Replace markings damaged by anti-skid materials, studded tires, tire chains, chemical deicers, snow plowing or other loss of marking material regardless of cause. When markings are damaged by pavement failure or by Owner's painting, crack sealing, or pavement repair operations, Contractor is released from warranty requirements for damaged work.
- D. A three-member team will evaluate warranty provisions. Team will consist of one member from Owner, one member from Contractor, and third person who is mutually acceptable to Owner and Contractor. Any costs for third person will be equally shared between Owner and Contractor. At least once each year, beginning with year after acceptance, team shall:
 - 1. Observe Owner taking readings by retro reflectometer, or review Owner records of such evaluation. The number of readings will be as large as necessary to ensure that minimum criteria are satisfied. Readings will be during period from March 15 through October, when pavement is clean and dry.
 - 2. Determine color fade, discoloration or pigment loss based on visual color comparison between original sample plates with glass beads and in-place pavement markings.
 - 3. Determine magnitude of material loss.
- E. Prepare list of defective areas and areas requiring additional inspection and evaluation to decide where material may need replaced. Provide traffic control as necessary if markings require more detailed evaluation.
- F. Replace failed or defective markings in entire section of defective markings within 30 days after notification when any of the following exists during warranty period:
 - 1. Average retro reflectivity within any 528-foot section is less than 1225 mcd/m²/1x for white pavement markings and 100 mcd/m²/1x for yellow pavement markings.
 - 2. Marking is discolored or exhibits pigment loss, and is determined to be unacceptable by three-member team based on visual comparison with beaded color plates.
 - 3. More than 15 percent of area of continuous line, or more than 15 percent of combined area of skip lines, within any 528-foot section of roadway is missing.
- G. Replace pavement marking material under warranty using original or better type material. Continue warranty to end of original 1 year period even when replacement materials have been installed as specified.

- H. When eradication of existing paint lines is necessary, eradicate by shot blast or water blast method. Do not gouge or groove pavement more than 1/16 inch during removal. Limit area of removal to area of marking plus 1 inch on all sides. Prevent damage to transverse and longitudinal joint sealers, and repair any damage.

3.7 PROTECTION

- A. Protect painted pavement markings from vehicular and pedestrian traffic until paint is dry and track free. Follow manufacturer's recommendations or use minimum of 30 minutes. Consider barrier cones as satisfactory protection for materials requiring more than 2 minutes dry time.

END OF SECTION

SECTION 32 18 16.13 - PLAYGROUND PROTECTIVE SURFACING

PART 1 GENERAL

1.1 SCOPE OF WORK

- A. The work specified in this section consists of the installation of Engineered Wood Fiber in accordance with these specifications, and in conformity with the dimensions and notes shown in the plans.

1.2 QUALITY ASSURANCE & COMPLIANCE DETAILS

- A. Accessibility of Surface Systems - ASTM F1951: Determination of accessibility of surface systems under and around playground equipment.
- B. Impact Attenuation - ASTM F1292: Impact attenuation of surface systems under and around playground equipment.
- C. Standard for Engineered Wood Fiber - ASTM F2075: Minimum characteristics for those factors that determine particle size, consistency, purity and ability to drain.
- D. IPEMA Certification: Manufacturer must provide proof of certification. "In the interest of public playground safety, IPEMA provides an independent laboratory which validates a manufacturer's certification of conformance to ASTM F1292 and ASTM F2075. A list of current validated products, their thickness and critical heights may be viewed at www.ipema.org."

PART 2 PRODUCT

- A. Product is manufactured of a ground wood fiber comprised of softwoods and/or hardwoods, consisting of randomly sized wood fibers the majority of which do not exceed 2" in length and no more than 15% fines to aid in compaction)
- B. Product to have minimal bark and to be free of twigs, leaf debris and other organic material.
- C. Product depth, after installation, must be in accordance with the procedure described in ASTM F1292 and meet guidelines for critical height as set forth by the Consumer Product Safety Commission for use of wood products for protective surfacing

PART 3 EXECUTION

- A. Above-ground systems must be properly graded. A 1% percent grade is recommended for proper drainage. engineered wood fiber systems should not be installed on grades exceeding 10 percent. Substrate must be firmly compacted, especially when additional fill material has been provided. The substrate should be free of stones, roots and other vegetation.

PART 4 INSTALLATION

- A. All materials provided by contractor, including product data, specifications, installation instructions and maintenance procedures, as well as all site specific plans, instructions and specifications, be reviewed by a certified engineer, architect or landscape architect familiar with local soil and climatic conditions.
- B. Further, purchaser should determine and specify fall heights and equipment use zones as required by the Consumer Product Safety Commission's Handbook for Playground Public Safety, applicable ASTM standards, and state and local codes and regulations

- C. Cover drainage system (either manufactured drainage or gravel) or earth substrate with geotextile fabric. Overlap all seams a minimum of 3 in. Slit fabric to fit around equipment uprights. Where possible, overlap at slits with next piece of fabric
- D. Install the engineered wood fiber to the proper depth, mounding in the center of the play areas of the playground. Extra materials will be provided to allow for compaction. Use a small front-end loader to spread surfacing. Operator should be careful not to travel on the fabric or turn sharply on the engineered wood fiber. It will also be necessary to spread manually. Install all the material delivered and please note that the surfacing will be several inches above desired level until it compacts. Engineered wood fiber needs to be compacted in order to be considered ADA accessible. This can be achieved over time and usage, or with a mechanical compactor. Saturating the initial load with water will help with compaction.
- E. For a smooth finished surface, hand rake. After two weeks of active use, surface should be raked again.

PART 5 WARRANTY

- A. Most Engineered Wood Fiber comes with a 25-year system or 15-year performance warranty. Request from your supplier a copy of our their Engineered Wood Fiber warranty

END OF SECTION

SECTION 32 31 13 – CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Chain link fabric, posts, braces, anchorage, gates, miscellaneous hardware and appurtenances.

1.2 REFERENCES

- A. ASTM A 53: Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- B. ASTM A 121: Standard Specification for Zinc-Coated (Galvanized) Steel Barbed Wire.
- C. ASTM A 392: Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric.
- D. ASTM A 491: Standard Specification for Aluminum-Coated Steel Chain-Link Fence Fabric.
- E. ASTM A 585: Standard Specification for Aluminum-Coated Steel Barbed Wire.
- F. ASTM A 641: Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
- G. ASTM F 567: Standard Practice for Installation of Chain-Link Fence.
- H. ASTM F 573: Standard Specification for Residential Zinc-Coated Steel Chain Link Fence Fabric.
- I. ASTM F 626: Standard Specification for Fence Fittings.
- J. ASTM F 654: Standard Specification for Residential Chain-Link Fence Gates.
- K. ASTM F 668: Standard Specification for Poly(Vinyl Chloride) (PVC)-Coated Steel Chain-Link Fence Fabric.
- L. CLFMI: Chain Link Fence Manufactures Institute Product Manual for Chain Link Fence Installation.
- M. WSDOT 8-12

1.3 SUBMITTALS

- A. Drawings: Indicate plan layout, grid, size and spacing of components, accessories, fittings, anchorage, and post section.
- B. Data: Submit manufacturer's installation instructions and procedures, including details of fence and gate installation.
- C. Submit sample of fence fabric and typical accessories.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Galvanizing: Class 3, ASTM A 121.
- B. Aluminizing: Class 2, ASTM A 585.
- C. Polyvinyl Chloride (PVC): With PVC coated materials, paint all posts, fittings, hardware and accessories as indicated to match PVC color. The fabric shall be hot dipped galvanized steel wire complying with ASTM A 392 and coated with a continuous PVC bonding process (minimum 15 mil thickness) in accordance with ASTM F 668. Color of PVC coating as indicated and applied free of voids, cracks, tears and to have a smooth and lustrous surface.
- D. Steel: Schedule 40, ASTM A 53.
- E. Cast-in-place Concrete: Class 3000 minimum, Section 033004.

2.2 CHAIN LINK FABRIC

- A. 11 gage steel wire fabric for all fences coated as follows.
 - 1. Zinc coating, ASTM A 392.
 - 2. Aluminum coating, ASTM A 491.
 - 3. Polyvinyl chloride coating, ASTM F 668.
- B. If polyvinyl coating is used, fences shall have green vinyl coating in open areas and black vinyl coating in wooded areas. All posts, cross bars, and gates shall be painted or coated the same color as the vinyl clad fence.
- C. Unless indicated otherwise use chain link fabric that has approximately 2 inches square mesh and coated after fabrication.
- D. Knuckle finish top edge and twist and barb bottom edge on fabric less than 60 inches wide. For fabric 60 inches or greater in width, twist and barb finish on both edges. Provide fabric that barbing has been done by cutting the wire on the bias.
- E. If indicated, insert slats in fabric.

2.3 BARBED WIRE

- A. Two strand, 12-1/2 gage wire with 14 gage, 4 point round barbs spaced approximately 5 inches on center.

2.4 TENSION WIRES AND FABRIC TIES

- A. Tension Wires: 7 gage galvanized coil spring steel wire, ASTM A 641.
- B. Fabric Fasteners: 9 gage galvanized or 6 gage aluminum wire, or approved noncorrosive metal bands, for ties to fasten fabric to posts, rails, and gate frames. Fasten fabric to bottom tension wire spaced 24 inches on center.

2.5 TRUSS OR TENSION BARS

- A. Galvanized steel rod 3/8 inch diameter for truss or tension bars used in trussing gate frames and line posts adjacent in end, corner, slope, or gate posts. When used in trussing line posts, provide adjustment by means of galvanized turnbuckles or other suitable tightening devices.
- B. Tension Bars:
 1. Galvanized high carbon steel bars not smaller than 3/16 inch x 3/4 inch for tensions bars to fasten fabric to end and corner posts and gate frames. Provide 1 tension bar for each end post and 2 for each corner and pull post per section of fabric.
 2. Use tension bar bands made from heavy pressed galvanized steel spaced on 15 inch centers to secure tension bars to posts.

2.6 POSTS, CAPS, RAILS, COUPLINGS

- A. Posts, Frames, Stiffeners, Rails:

Table 1 – Posts, Frames, Stiffeners, Rails	
Proposed Use	Nominal Type and Size
End, corner, slope and gate posts for single gates 6 feet or less in width and double gate 12 feet or less in width for 1. Fence less than 72 in. high 2. Fence 72 inches or higher	2-1/2" pipe
Gate posts for single swing gates over 6 feet, but not over 13 feet in width and doubleswing gates over 12 feet, in width or for all slide gates with leaves but not over 26 feet in width or for all slide gates with leaves larger than 6 feet	3-1/2" pipe
Gate posts for single swing gates over 13 feet, but not over 18 feet in width and double swing gates over 26 feet, but not over 36 feet in width	6" pipe
Gate posts for single swing gates over 18 feet in width and double swing gates over 36 feet in width	8" pipe
Frame for gates	1-1/2" pipe
Stiffeners for gates	1-1/4" pipe
Line posts for fence 72 in. or higher	2" pipe
Line posts for fences less than 72 in. high	1-1/2" pipe, or 1-1/8" x 1-5/8" H
Top rail	1-1/4" pipe, or 1-1/2" x 1-1/4" H
Bottom rail	6-gage, coiled spring steel tension wire

- B. Posts: Galvanized steel, at the indicated length.
- C. Caps: Pressed galvanized steel or malleable iron designed to fit securely over post ends forming a weather tight closure. Where top rail is used, provide cap to permit passage of top rail. "H" section posts do not require caps.

- D. Top, Intermediate and Bottom Rails: Galvanized steel, in lengths as required. Provide joint couplings to connect rails securely. Provide means for attaching top rail securely to each end, corner, line, slope and gate posts.
 - E. Joint Coupling: Galvanized steel, 6 inches long minimum for each joint. 1 coupling in 5 shall have expansion spring. Couplings shall be outside sleeve type with bore of sleeve true to maintain adjacent lengths of rail in alignment.
- 2.7 FITTINGS AND HARDWARE
- A. Unless indicated otherwise, galvanize fittings and hardware.
 - B. Rivets: Make all hardware attachments with galvanized steel rivets.
- 2.8 SUPPORT OR EXTENSION ARM
- A. Use support or extension arms for barbed wire that are of a type that can be attached to the tops of the posts and carry the number of wires indicated.
 - B. Use only support arms on the fence for barbed wire that are capable of supporting a 250 pound vertical load at the end of the arm without causing permanent deflection.
 - C. Single support arms are to be integral with a top post weather cap and have a hole for passage of the top rail when required.
- 2.9 GATES
- A. Residential gates: Refer to ASTM F 654 requirements.
 - B. Provide additional horizontal and vertical members to ensure proper gate operation and for attachment of fabric, hardware and accessories.
 - C. Assemble gate frames and attach hardware by welding or by using fittings and rivets to make rigid connections. Use same fabric as for fence. Install fabric with stretcher bars to gate frame at not more than 15 inch on center.
 - D. Provide diagonal cross-bracing consisting of 3/8 inch diameter adjustable length truss rods on gates where necessary to prevent frame from sagging or twisting.
- 2.10 GATE HARDWARE
- A. Hinges: Pressed steel or malleable iron to suit gate size, non-lift-off type, offset to permit 180 degree gate opening. Provide minimum of one pair of hinges for each leaf.
 - B. Latch: Forked steel type or plunger-bar steel type to permit operation from either side of gate. Provide locking device and padlock eye as integral part of latch.
 - C. Keeper: Provide keeper for all vehicle gates which automatically engages the gate leaf and holds it in the open position until manually released.
 - D. Gate Stops: Mushroom type or flush plate with anchors set in concrete to engage the center drop rod or plunger bar.
 - E. Sliding Gates: Manufacturer's standard heavy-duty track, ball-bearing hanger sheaves, overhead framing and supports, guides, stays, bracing, steel wheel or rubber wheel, and accessories as required.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Identify utility location.
- B. Excavation, Section 312316.
- C. Refer to ASTM F 567 and CLFMI products manual for chain link fence installation.
- D. Protect roots and branches of trees and plants to remain.
- E. Limit the amount of clearing and grading along the fence line to permit proper installation.

3.2 LAYOUT OF WORK

- A. Accurately locate and stake locations and points necessary for installation of fence and gates.
- B. General arrangements and location of fence and gates are indicated. Install except for minor changes required by unforeseen conflicts with work of other trades.

3.3 INSTALLATION OF POSTS

- A. Space line posts as follows:
 - 1. Tangent sections to 500 feet radius: 10 feet maximum.
 - 2. 200 feet radius to under 500 feet radius: 8 feet maximum.
 - 3. 100 feet radius to under 200 feet radius: 6 feet maximum.

4. Under 100 feet radius: 5 feet maximum.
 - B. Provide pull posts at 500 feet maximum intervals. Changes in line of 30 degrees or more are considered corners.
 - C. Set all posts to true line and grade in concrete bases or in approved pipe sleeves or sockets. Check for vertical and horizontal alignment.
 - D. Construct concrete bases for posts at least 10 inches in diameter. Place a minimum of 6 inches concrete below each post. Depth of post in concrete as follows.
 1. Line Posts: 18 inches.
 2. End, Pull, Corner and Gate Posts Less Than 6 inches Diameter: 24 inches
 3. Gate Posts: 30 inches.
 - E. Where posts are required to be set in concrete walls or masonry, set sockets for the posts to a depth of at least 18 inches. Use sockets that consist of lengths of 0.048 inch galvanized metal pipe sleeves, with an inside diameter sufficient to allow the posts to fit loosely therein. Coat the inside of the socket and outside of the posts with an approved bituminous paint. Caulk the posts securely in place with lead wool.
- 3.4 INSTALLATION OF BRACE ASSEMBLIES
- A. Attached brace rail from end, pull, corner or gate posts to first ensuing line post. Install braces so posts are plumb when diagonal truss rod is under proper tension.
- 3.5 INSTALLATION OF RAILS
- A. Install rails level and plumb with grade between posts and attached to posts before stretching fabric. Top rails shall form continuous brace from end-to-end of each run of fence.
- 3.6 INSTALLATION OF FENCE FABRIC
- A. Place fence fabric on security side of posts unless otherwise specified. Place fabric approximately 1 inch above the ground. Maintain a straight grade between posts by excavating high points of the ground. Filling depressions with soil will be permitted only upon approval of City Engineer.
 - B. Stretch the fabric taut and securely fasten to posts. Fasten to end, gate, corner, and pull posts. Secure stretcher bars with metal bands spaced at 15 inch intervals. Cut the fabric and fasten each span independently at all pull and corner posts. Fasten to line posts with tie wire, metal bands, or other approved methods at 15 inches intervals. Attach the top edge of fabric to the top rail or tension cable at approximately 24 inches intervals. Attach bottom tension wire to fabric with tie wires at 24 inches intervals and secure to the end of pull posts with brace bands.
 - C. Draw barbed wire to assure minimum sag at high temperature and no breakage at low temperature. Connect the wires and arms by means of 0.142 gauge galvanized wire stays.
- 3.7 INSTALLATION OF GATES
- A. Install gates plumb, level, and secure for full opening without interference. Install ground-set items in concrete for anchorage as recommended by the fence manufacturer. Adjust hardware for smooth operation.
- 3.8 REPAIR DAMAGED COATING
- A. Grind smooth and wire brush all welds made after galvanizing to remove loose or burned zinc coating, after which neatly coat the areas with 50-50 solder or as otherwise directed by City Engineer. Make repairs to abraded or otherwise damaged zinc coating in a similar manner. Replace PVC coating.

END OF SECTION

SECTION 32 33 00 - SITE FURNISHINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Bike Shelter
- B. Benches
- C. Storage Sheds
- D. Dog Waste Stations

1.2 RELATED REQUIREMENTS

- A. 01 30 00 - Administrative Requirements: for additional requirements of preinstallation meeting.
- B. 01 60 00 - Product Requirements: for substitution and additional product requirements.
- C. 01 74 19 - Construction Waste Management and Disposal: Limitations on disposal of removed materials; requirements for recycling.
- D. 07 76 16 - Roof Pavers.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week before the start of work for this section in accordance with Section 01 30 00 - Administrative Requirements.

1.4 SUBMITTALS

- A. Product Data: Provide product criteria, characteristics, accessories, jointing and seaming methods, and termination conditions.
- B. Shop Drawings: Indicate extents, special joint or termination conditions, and conditions of interface with other materials.
- C. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.
- D. Warranty: Submit manufacturer's warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- E. Maintenance Data: For user operation and maintenance of system including:
 - 1. Methods for maintaining system's materials and finishes.
 - 2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in the manufacture of work specified in this section with minimum 5 years of experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

PART 2 PRODUCTS

2.1 SEE DRAWINGS FOR OWNER FURNISHED, CONTRACTOR INSTALLED ITEMS.

2.2 BIKE SHELTER

- A. (SITE-7) BICYCLE COVERED SHELTER
 - 1. Basis of Design: Vizer Shelter by Dero. Comparable and substituted products will be judged based on the following performance criteria and features.
 - 2. Materials: steel tube framing and 26g galvanized steel roof, hot-dipped galvanized finish.
 - 3. Installation Method: surface mount to suitable base as approved by manufacturer.
 - 4. Parking capacity: 8 bikes.

2.3 BENCHES

- A. (SITE-5) Site Benches, with back, without arms:

1. Basis of Design: 2ZK5657 8'L Champion Bench by The Bench Factory. Comparable and substituted products will be judged based on the following performance criteria, features, warranty, and qualifications.
 2. Substitutions for products by manufacturers other than those listed above: See Section 01 60 00 - Product Requirements.
 3. Performance Criteria:
 - a. Passes: Testing in accordance with ANSI/BIFMA X5.4-2005 – Standard Test for Lounge Seating.
 - b. Steel benches.
 4. Features:
 - a. Back: Yes.
 - b. Arms: No.
 - c. Center Divider: No.
 - d. Mounting: Inground mount.
 - e. Color: Black.
 - f. Size: 19.5 inches deep x 31 inches high x 96 inches long.
 - g. Recycled Content: Minimum 90 percent.
 - h. Post-Consumer Material Content: Minimum 51 percent.
 - i. Pre-Consumer Material Content: Minimum 31 percent.
- 2.4 STORAGE SHEDS
- A. (SITE-3) Storage Shed
 1. Basis of Design: 6402 Outdoor storage shed by Lifetime
 - B. (SITE-4) Storage Shed
 1. Basis of Design: 60075 Outdoor storage shed by Lifetime
- 2.5 DOG WASTE STATION
- A. (SITE-8) Dog Waste Station
 1. Basis of Design: WB695795 Steel Pet Waste Station With Rolled Waste Bags, Green by Global Industrial
- 2.6 ACCESSORIES
- A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.
- PART 3 EXECUTION**
- 3.1 EXAMINATION
- A. Verify existing conditions meet the manufacturer's requirements before starting work.
- 3.2 PREPARATION
- A. Prepare surfaces to receive work in accordance with manufacturer's instructions.
- 3.3 INSTALLATION
- A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.
- 3.4 CLEANING
- A. Dispose of all waste material in accordance with project's Waste Management Plan.
 1. See Section 01 74 19 - Construction Waste Management and Disposal for additional requirements.
- 3.5 PROTECTION
- A. Protect installed work as required by the manufacturer to maintain product performance, design criteria, and warranty.

END OF SECTION

SECTION 32 80 00 - IRRIGATION COMPONENTS

PART 1 GENERAL

1.1 SCOPE OF WORK

- A. Furnish all labor, materials equipment and related items necessary to complete the work identified in these Specifications. Provide a complete and operable, underground, automatic irrigation system with complete and uniform water coverage for all new landscape areas identified on the Landscape Plan. The items of work to be performed include, but are not limited to:
 - 1. Provide trenching and backfilling for piping/wiring.
 - 2. Provide and install irrigation sleeving.
 - 3. Provide and install pipe, sprinkler heads, fittings, valves and valve boxes.
 - 4. Provide and install valve control wire and controller.
 - 5. Guarantee, maintenance, protection and system testing.
 - 6. All other related items required to complete the work in the best-accepted trade practices.

1.2 SYSTEM COVERAGE CRITERIA

- A. Coverage: The irrigation system shall provide 100% coverage of all areas as directed. Irrigation heads shall be located and adjusted to avoid over-spray on paved surfaces.
- B. Zoning: Number of zones shall be determined by designer and shall be based on available water pressure at the site. Contractor shall inform Landscape Architect of any and all problems with pressure and/or flow to site.

1.3 PROTECTION OF WORK, PROPERTY, UTILITIES AND PERSONS

- A. Provide protection of all property, persons, work in progress, structures, utilities, walls, walks, curbs and paved surfaces from damages incurred arising from this Contract. The Contractor shall pay for any repair of such damage at no additional cost to the Owner. Verify locations of all underground utilities prior to commencement of work. Existing known utilities have been shown on the Architectural/Engineering or Survey Drawings. The Contractor shall be responsible for the protection of said utilities. Promptly notify the General Contractor and Owner of any conflict between proposed work and obstruction(s).
- B. Notify local utility companies a minimum of 48 hours prior to beginning work.

1.4 SUBMITTALS

- A. At least 30 days prior to beginning work described in this section submit the following data for products submitted for review.
 - 1. Manufacturer's descriptive data including operating materials used in products, test certificates, special features, guarantees and other data required to completely describe the product.
 - 2. Samples of the proposed substitution when requested. Samples will be returned to Contractor whether or not approval is given.
- B. Product Data: Material and equipment composite data sheets shall be submitted for the following:
 - 1. Galvanized pipe
 - 2. PVC pipe
 - 3. Gate valves
 - 4. Pressure gauges

5. Manual drain valve
6. Quick coupling valves (inc. key and hose swivel)
7. Control valves
8. Communication, control, and trace wire
9. Wire splices (all types)
10. Swing joints
11. Sprinkler heads/nozzles

- C. Submit the number of copies required by the Contract Documents. Clearly index, label, and highlight products to be utilized.

1.5 VERIFICATION OF SITE CONDITIONS

- A. Before proceeding with any work, the Contractor shall verify all dimensions pertaining to the location of existing irrigation equipment. Contractor shall verify location and depth of service lines, existing irrigation mainline and available static water pressure. Should any error or conflicts in the Drawings and/or Specification be found, the Contractor shall immediately notify the Owner's Representatives.
- B. Interruption of Existing Water Service: Do not interrupt water service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water service according to requirements indicated:
1. Notify Owner no fewer than (2) working days in advance of any proposed interruption of water service. Do not proceed with interruption of water service without Owner's written permission.
- C. Utilities and Existing Structures: The exact location of existing structures and overhead or underground utilities, shall be determined by the Contractor and he shall conduct his work so as to prevent interruption of service or damage to them. Protect existing structures and utility services and repair damages.
- D. Finish Grades: Verify the correctness of all finish grades within the work area to insure the proper soil-coverage depth over pipe lines.

1.6 CLEANUP

- A. All paved surfaces shall be kept clean of soil and debris on a daily basis.
- B. Contractor shall be responsible for cleaning all paved surfaces affected by irrigation work prior to final acceptance.

1.7 GUARANTEE AND REPLACEMENT

- A. All materials and workmanship shall be guaranteed for a period of one year. Guarantee period shall commence when written Final Acceptance is granted. This guarantee does not apply to work or damage done to the system by others after Final Acceptance. Guarantee shall also cover repair of damage to any part of the premises (including seed mix areas) resulting from leaks, settlement or other defects in materials, equipment and workmanship to the satisfaction of the Owner.

1.8 SYSTEM PROTECTION

- A. During the one-year guarantee period, the Contractor shall be responsible for deactivating and draining the system prior to freezing weather. A compressor shall be used to blow the system dry. Contractor shall reactivate the system at the onset of the Spring growing season. Both operations shall be performed once during the guarantee period.

- B. Contractor shall notify the Owner in writing of the dates the system was winterized and reactivated, and shall be held responsible for any damages resulting from the failure to comply with the above procedure.
- C. When using compressed air to winterize the system, do so in two (2) short cycles at no more than 75-psi pressure. Do not allow pipe to compressor to get hot to the touch. The Contractor shall winterize the system prior to irrigation system substantial completion approval and acceptance if freezing weather occurs or is forecast. In such an event, the Contractor shall, as directed by the Landscape Architect, reactivate the system for final inspection and acceptance.
- D. Winterization and reactivation prior to final acceptance will not satisfy the warranty period requirement to deactivate (winterize) and reactivate the irrigation system.
- E. Fill and repair depressions and replace construction materials damaged from settlement or repair of irrigation trenches, throughout the warranty period.
- F. Adjust sprinkler heads as necessary to maintain complete, 100% overlap coverage, and to keep spray off structures, out of roadways, and off pavements throughout the warranty period.
- G. Replace defective parts throughout the warranty period.

1.9 SYSTEM MAINTENANCE

- A. Provide maintenance of the irrigation system until Final Acceptance including head and nozzle adjustment, setting and adjusting controller times, and replacing defective materials.
- B. Operations and Maintenance Manual:
 - 1. At, or before, Substantial Completion review of irrigation system, submit for review one (1) manual, bound in hardback, 3-ring notebook, to Owner's Representative. At a minimum, the following information/items are required to be in the manual:
 - a. List of authorized distributors and service representatives for each item of irrigation equipment, including names, addresses and telephone numbers.
 - b. Guarantee/warranty certificates for all equipment used and Contractor's written warranty for entire system one (1) year guarantee.
 - c. Parts lists for each item with exploded views of each item showing part numbers.
 - d. A pocket for one (1) blue-line print of the reviewed mylar record drawings laminated in clear plastic. This print shall be added at time of Final Inspection.
 - e. Controller cabinet keys.

1.10 PERMITS, CODES AND ORDINANCES

- A. Obtain and pay for all necessary permits and fees as required by applicable codes and ordinances for this work.
- B. Comply with all applicable codes, regulations and ordinances.

1.11 SUBSTITUTIONS

- A. Specific reference to manufacturer's names and products specified in the Section are used as standards, but this implies no right to substitute other material or methods without written approval of the Owner's Representative.
- B. Installation of any approved substitution is Contractor's responsibility. Any changes required for installation of any approved substitution must be made to the satisfaction of the Owner's Representative and without additional cost to Owner.

- C. No substitutions will be permitted which the Owner's Representative has not submitted for prior review and comment.
- D. Review by Owner's Representative of substituted equipment and/or dimensional drawings do not waive these requirements.

1.12 REVIEWS

- A. Contractor shall coordinate all review processes and dates with Owner's Representative. Contractor shall give the Owner's Representative 48 hours' notice prior to any inspection. Contractor is responsible for uncovering/unearthing any sections of installation upon request from Owner's Representative. Contractor is responsible for providing inspections of trench depths, head layout, pressure tests and performance tests.
- B. Contractor shall provide a written Irrigation Installation plan summarizing proposed sequences of installation, methods of installation and estimated dates of completion. This work plan shall accompany requested Submittals and will be approved prior to installation of Irrigation System.
- C. Mainline trench depth, component placement and pressure tests may be accomplished concurrently. Mainline may be installed and tested in sequences, three (3) sequences maximum. Each section shall remain uncovered at all connections and valve assemblies. Each subsequent section shall be tested in conjunction with preceding section (not isolated).

1.13 OWNER TRAINING

- A. Prior to Final Acceptance of work, Contractor shall provide the Owner with all keys, tools and maintenance manuals necessary to operate/deactivate the irrigation system. The Contractor shall train and instruct the Owner's Representative as to the operation and maintenance of the irrigation system.

1.14 RECORD DRAWINGS

- A. Furnish Record Drawings/As-Builts of the complete irrigation system in accordance with the following conditions:
 - 1. Contractor will be provided with CD/USB drive with PDF showing irrigation work as designed under this contract.
 - 2. Maintain the blue-line prints on site at all times during construction. Make a daily record of all work installed on the prints.
 - 3. On the prints, show actual locations of valves, master valves, gate valves, risers, piping and sleeving. Dimension from easily identified permanent features such as buildings, curbs, fences, walks or property lines.
 - 4. Show approved manufacturer's name and catalog number on prints.
 - 5. Make drawings to scale with all notations neat in appearance.
 - 6. After testing and review of mainlines and laterals for backfill, transfer all information noted on blue-line prints to the mylar in a neat, orderly way.
 - 7. Turn the Record Drawings over to the Owner's Representative in PDF format on CD/USB for review after Final Inspection of the Project. Record Drawings must be submitted, reviewed and corrected if required prior to final payment.

1.15 EXTRA MATERIALS

- A. Prior to final acceptance, the Contractor shall provide to the Owner (at no additional cost to the Owner), the keys and/or other tools necessary to activate, operate, and drain the system, including:
 - 1. Two (2) quick coupling valve keys w/ hose swivels.
 - 2. Two (2) quick coupling valve cover keys.
 - 3. Two (2) manual gate valve keys.

4. Two (2) of each type of rotor head installed.
5. Five (2) of each type of spray head installed.
6. All extra nozzle sets not utilized during the installation.
7. Two (2) valve box cover keys.

PART 2 PRODUCTS

2.1 PLASTIC PIPE

- A. Polyvinyl Chloride Pipe (PVC):
 1. Pressure Mains, Laterals and Sleeving - All Sizes: Polyvinyl chloride (PVC) 1120, 1220, Schedule 40, solvent weld and shall conform to ASTM D1785.
 2. Threaded Pipe, Adapters and Nipples: PVC 1120 or 1220, Schedule 80, conforming to ASTM D1785.
- B. Pipe shall be marked with manufacturer's name, class of pipe, NSF seal and date and shift of manufacturing run. Pipe shall bear no evidence of interior or exterior extrusion marks.
- C. Pipe walls shall be uniform, smooth and glossy. Pipe may be pre-belled or with individual solvent-weld couplings.
- D. Fittings shall be PVC Schedule 40, full size unless otherwise noted. Fittings shall be of brand(s) recommended by manufacturer of pipe.

2.2 DUCTILE IRON PIPE

- A. Ductile iron pipe shall comply with WDOTSS 9-30.1(1).

2.3 GALVANIZED PIPE AND FITTINGS

- A. Galvanized Pipe shall be Schedule 40, domestic manufacture, and shall conform to ASTM A 53. Fittings shall be malleable galvanized.
 1. All galvanized pipe and fittings installed below grade shall be painted with Fields A470 "Rainstop", nonfibered, asphalt coating.
 2. All galvanized pipe fittings installed above grade shall be painted with one coat of galvanized metal primer followed by one coat matte black alkyd oil enamel.

2.4 PIPE THREAD TAPE / COMPOUND

- A. All galvanized pipe threads shall be wrapped at least three (3) times, but no more than four (4), with Teflon tape. A thin coat of Rector Seat T+2, Teflon paste shall be applied on top of the Teflon tape prior to assembly

2.5 PIPE AND WIRE SLEEVES

- A. Pipe sleeves shall be twice the diameter of the pipe passing through it, but no smaller than 4 inches (4") in diameter. No more than one pipe shall be installed in each sleeve.
- B. Control and communication wire shall be installed in separate 2 inches (2") diameter CL-200 PVC sleeves.
- C. Sleeve under all paved surfaces and where indicated on Drawings.
- D. Extend sleeves minimum 24 inches (24") past both sides of pavement edge.

- E. Mark sleeve ends with a 2x4 wooden stake driven 18 inches (18") into grade with 24 inch (24") exposed. "IR Sleeve" shall be imprinted in on each stake in black, waterproof ink. The top of each stake shall be painted with fluorescent pink marking paint and shall be further marked with three wraps of fluorescent pink flagging tape. Remove stakes after irrigation lines are installed.
- F. No additional payment shall be made under any circumstances for locating sleeves.
- G. Mainline and lateral piping shall be sleeved using Ductile Iron Pipe.

2.6 SOLVENT WELD COMPOUND

- A. Two-step application using Weld-on P-70 purple primer and Weld-on 727 Clear, fast setting PVC glue or as recommended by pipe manufacturer to meet site conditions encountered. Submit product information for approval.

2.7 REMOTE CONTROL VALVES

- A. Valves shall be Rainbird 100-PEB-Series: size as shown on the Drawings. Supply each valve with PRS pressure-regulating valve and adjust pressure as shown on plan.
- B. Each Remote Control Valve shall be supplied with an identification tag . Each valve shall be numbered as shown on Plan.

2.8 QUICK COUPLER VALVE

- A. Quick coupler valves located on Pressure Mainline shall be Rainbird 44 LRC with locking rubber cover. Provide with valve key and hose swivel for each quick coupler valve.

2.9 MANUAL DRAIN AND CONTROL VALVE

2.10 IRRIGATION HEADS

- A. Spray heads for Seed Mix #1 areas shall be Rainbird 1800 Series with 6" pop-up heights. Nozzles as indicated on Plan.

2.11 CONTROL WIRE

- A. Control Wire shall be Hunter Two-Wire. Valve wire shall be direct burial wire, Copper, insulated. Wire to be twisted red/blue pair.
- B. Splice: Watertight electrical splices shall a dry splice 3M-DBYconnector or approved equal. Submit sample for approval.
- C. Electrical Tape: Black plastic, 3/4" wide, spec. grade, minimum .007" thick, all weather type.
- D. Duct Tape: All weather cloth tape.
- E. Plastic Ties: Clear plastic locking ties. Size to allow for pipe diameters.
- F. Locator wires for below-grade piping shall be #14 bare copper, U.L. approved as UF, ASTM B-3 rated.

2.12 VALVE BOXES AND VAULTS

- A. Valve Boxes shall be a combination of polyolefin and fibrous material. Extensions may be required to bring the valve box to the proper level. Utilize drop in style covers unless specified otherwise. Boxes shall be as follows:
 - 2. Manual Drain Valve, Quick Coupler Valve, Master Control Valve, and Flow Meter : Carson 10" Diameter Valve Box, model #0910-18 HDPE w/6" with Hex Bolt.
 - 3. Automatic Control Valve: Carson 14"x19" Standard Rectangular Box, model #1419-12 HDPE with Hex. Bolt.
 - 5. Concrete pavers for Valve Box support shall be Contractor's choice; confirm with OWNER'S REPRESENTATIVE

2.13 MISCELLANEOUS KEYS

- A. Provide three (3) of each of the following keys: Manual drain key, valve box cover lock key, controller cabinet key.

2.14 DRAIN ROCK

- A. Gravel Backfill for Drains.

2.15 ELECTRICAL CONDUIT

- A. This specification pertains only to low voltage wiring. All 120-volt power specifications are referred to Section 16000 – Electrical.
- B. Conduit above finish grade shall be rigid galvanized steel with zinc-protected threads. Fittings shall be of the same material with hot dipped galvanized finish.
- C. Conduit within a building shall be EMT where permitted by Code. Fittings shall be suitable for this product.
- D. Conduit within the ground shall be Schedule 40 Rigid PVC. Fittings shall be suitable for this product.
- E. Conduit for underground communication cable for centrally-controlled systems, when not buried with irrigation piping, shall be Schedule 40 gray PVC, 1-1/2" diameter, with pre-manufactured sweeps. Above grade conduit for PE89 shall be rigid steel as described above.
- F. All equipment furnished and installed shall be in accordance with National, State, and City Electrical Codes, established safety codes and applicable local codes and ordinances.
- G. Conduit runs shall be a maximum 400 feet without a pull box. Pull boxes shall be located every 400 feet.
- H. Pull boxes shall be as noted in herein with "ELECTRICAL" permanently branded on the lid.

2.16 MAINTENANCE EQUIPMENT

- A. Provide two (2) manufacturer's service wrenches for each head type requiring wrenches for servicing or adjustment.

PART 3 EXECUTION

3.1 VERIFICATION

- A. Prior to installation, verify that adequate gallonage and pressure is available to properly operate the irrigation system. Immediately notify Owner's Representative of inadequate conditions.

3.2 LAYOUT

- A. Layout work as accurately as possible to Drawings. Drawings are diagrammatic to the extent that swing joints, offsets and all fittings are not shown. No changes to irrigation system will be made by the Contractor without approval of the Landscape Architect.
- B. Accurately stake head locations, following the design shown on the Drawings. Do not exceed manufacturer's recommended spacing. Alterations and changes to the layout may be expected in order to conform to ground conditions and to obtain full and adequate coverage of water. No changes or alterations in the Irrigation Plan shall be made without the prior authorization of the Owner's Representative.
- C. Adjust layout as necessary to install around existing work. Where piping is shown to be under paved areas, but running parallel and adjacent to planted areas, intention is to install piping in planted areas. Do not install piping directly over another line in common trench. Offset piping to opposite sides of the trench.

3.3 TRENCHING

- A. Provide all excavations as required for installation of work included in this Section, including shoring of earth banks, if necessary. Restore all surfaces, existing underground installations, etc., damaged or cut as a result of the excavation, to their original condition.
- B. Contractor shall submit a written schedule of Trenching and Irrigation Pipe installation for approval by Owner's Representative prior to beginning trenching. This schedule shall include, at the very least the proposed dates of beginning of mainline trenching, completion of mainline pipe installation, beginning of lateral pipe trenching and completion of lateral pipe installation. Trenching and installation may be phased to facilitate Pressure Testing, 2 phases only permitted.
- C. Dig trenches wide enough to allow a minimum of 4" between parallel pipe lines. Trenches shall be of sufficient depth to provide minimum cover from finish grades as follows:
 - 1. Over PVC mainline pipe and control wires: 18" minimum cover.
 - 2. Over pipe on non-pressure side of irrigation control valve (lateral lines): 18" minimum cover.
 - 3. Over all sleeving: 24" minimum cover.
 - 4. Excavate to depth required in any material encountered with no extra compensation. Backfill all irrigation trenches with clean sand.
 - 5. Install pipe with manufacturer's markings facing up (12 o'clock).
 - 6. Where multiple irrigation pipes share a common trench, trench shall be sufficiently wide (or piping shall be arranged) to allow four inches (4") minimum of horizontal separation and six inches (6") minimum of vertical separation between piping, while maintaining specified minimum and maximum cover over piping. Irrigation pipes shall be located in a separate trench from any domestic water piping.
- D. Dispose of all surplus suitable excavation from trenches off-site.

3.4 SLEEVING

- A. Install sleeves under all paved surfaces as required to facilitate installation of the irrigation work.
- B. Irrigation mainline and lateral sleeves shall have one sleeve per irrigation pipe. Wire chase sleeves are not shown on the drawing but shall be installed adjacent to all mainline sleeves. Wire chase sleeves shall be a minimum of 2" in diameter.

- C. Extend sleeves a minimum of 24" beyond the edge of curbs, walks, walls and/or other paved surfaces. Cap and identify sleeve ends.
- D. Plug ends of sleeves around insert piping with fiberglass insulation material to prevent soil from entering ends. Complete this prior to backfilling of trenches.
- E. Compact backfill to a minimum of 92% per ASTM D1557.
- F. Bore underneath existing pavements to install sleeves for wiring and mainline. Minimum depth of top of sleeve to pavement elevation is twenty four inches (24").

3.5 QUICK COUPLERS

- A. Install on triple swing joints as detailed and specified. Set top of all quick coupler valve boxes flush with final finish grade. Set all quick coupler valves perpendicular to finish grade. Valve box shall be no closer than 12" to pavement except as noted.
- B. Quick Coupling Valve shall be installed a minimum of twelve inches (12"), and maximum of thirty-six inches (36") from pavement or lawn edge (except at point of connection). The maximum distance from the top of the quick coupler to the top of the valve box shall be three inches (3"). Make sure quick coupler key easily passes the top of the valve box when fully engaged. The valve shall be installed inside a ten inch (10") round valve box. Care must be taken to prevent excessive water backup within the valve box.
- C. A six-inch (6") layer of washed gravel backfill for drains shall be placed in the bottom of the valve box, encased in a layer of geotextile fabric.
- D. Thoroughly flush mainline before installing Quick Coupling Valves.

3.6 DRAIN VALVES

- A. Install electric drain valve per detail and as described herein.
- B. All valves to be installed at locations shown on plans, verify with OWNER'S REPRESENTATIVE prior to installation.

3.7 CONTROL WIRING

- A. Wiring between automatic controller and automatic control valve shall comply with National Electric Code, latest edition.
- B. Splices will be permitted only at junction boxes, valve boxes, or at control equipment. A minimum of 2' of excess conductor is to be left at all splices, terminal and control valves. Encapsulate all splices with approved connectors.
- C. All control wire that is not installed within mainline trench shall be buried at 24" depth minimum and sleeved with appropriately sized Schedule 40 PVC conduit (or better). Sleeve shall be continuous from mainline trench to mainline trench and from mainline trench to controller. All control wire installed above ground shall be encased (sleeved) within intermediate metal conduit and fittings (or better). All such sleeves shall be marked on "as-built" drawing.

3.8 REMOTE CONTROL VALVES

- A. Install in approximate locations shown on plan, outside of paved areas and grouped together where possible.

- B. Where valves occur adjacent to paved areas, install so that the valve box will be no closer than 12" to paving and perpendicular or parallel to it. Grouped valves shall be spaced evenly to present a neat appearance. Valve boxes shall be installed 1/2 inch above finish grade.
- C. Enclose all valves in individual valve boxes. Use valve box extensions as required. Install as per detail and locate precisely by dimensions from two (2) fixed objects on Record Drawings.
- D. Valve bonnet packing and bolts shall be checked and tightened.
- E. Provide sufficient room within valve box to service or replace all equipment. Place Valve Boxes on concrete pavers on all four corners. Valve Boxes shall be level and exhibit zero movement. Backfill around boxes and compact to 95%.

3.9 PIPE AND FITTINGS

- A. Transport and store pipe on a flat and even surface.
- B. Seal all threaded joints with 3 wraps minimum of Teflon tape. No PVC pipe shall be threaded or connected to a threaded fitting without an adapter.
- C. Prior to construction of this project, Contractor shall provide the Owner's Representative with written evidence that all Contractor staff assigned to solvent welding duties of PVC pipe or fittings are in possession of an up-to-date certification card issued by manufacturer representative of specified solvent cement. If Contractor's staff are not in possession of current certification cards, the Contractor shall schedule and complete a training seminar (conducted by solvent cement manufacturer representative) and provide written evidence of training completion for each staff member, to the Owner's Representative prior to construction. Only staff that are certified shall be permitted to solvent weld pipe and fittings.
- D. All gasketed and solvent weld plastic pipe shall be installed in accordance with manufacturer's installation instructions. Great care shall be taken to ensure that the inside of the pipe is absolutely clean. Pipe ends (not being worked) shall be protected and not left open. Cleaning of cutting burrs is mandatory.
- E. For solvent weld pipe, PVC pipe ends shall be cut at a 90-degree angle to the pipe length and shall be cleaned (use approved reaming tool) of all burrs prior to cementing. Pipe ends shall be wiped clean with a rag that has been lightly wetted with PVC thinner. Joints shall be completely free of moisture or condensation.
- F. Cement shall be applied with a light coat on the inside of the fitting and a heavier coat on the outside of the pipe (no further back from the end of pipe than the fitting would slip). Application of cement on the interior of the fittings shall be quantified to ensure no cement shall be pushed into the flow stream of the pipe. Pipe shall be inserted into the fitting and given a quarter turn to seat the cement. Excess cement shall be wiped from the outside of the pipe. Cement that becomes unduly thick or heavy shall not be thinned and re-used. **CONTRACTOR SHALL DISPOSE OF SAME.** Pipe shall be tested as indicated elsewhere in these specifications.
- G. Allow 15 minutes (minimum) set-up time for solvent weld joints before moving or handling. Pipe shall be partially center-loaded to prevent arching or slipping. No water shall be permitted in the pipe for at least 10 hours to permit solvent weld set and cure. Backfilling shall be done when the pipe is not in an expanded condition due to heat or pressure. Cooling of the pipe can be accomplished by operating the system for a short period of time before backfilling, or by backfilling in the early part of the morning before the heat of the day. Before pressure testing, allow 24 hours cure time for solvent weld joints.

- H. Lateral line pipe may be longitudinally bent at a ratio of 200 times the outside diameter (o.d.) of the pipe over the length of one (1) full stick of pipe [i.e.: 1-1/2" pipe (1.9" o.d.) can be bent to a minimum radius of 1.9 x 200 or 380 inches (31.7') over 20'].

3.10 FLUSHING

- A. Flush all mainlines once prior to the installation of valves, and again after the installation of valves and prior to pressure testing.
- B. Flush all lateral lines prior to the installation of sprinkler nozzles.

3.11 PRESSURE TEST

- A. General:
 - 1. To be valid, all tests must be observed by the Owner's Representative.
 - 2. Submit verbal requests for review to Owner's Representative at least 48 hours prior to anticipated testing. Do not request testing until satisfied that work will pass test.
- B. Preparation:
 - 1. Prior to request for preliminary testing, accomplish the following:
 - a. Install all piping, valves and other equipment except sprinkler heads.
 - b. (Cap all risers except first riser downstream from valve on each lateral.
 - c. Purge all air from mainlines.
- C. All joints and connections shall be left exposed until after completion and acceptance of pressure test.
- D. Entire mainline shall be capped and pressurized to 100 PSI for a period of 30 minutes without introduction of additional service or pumping pressure. Lines that show loss of pressure exceeding 5 PSI at the end of specified test period shall be rejected.
- E. Test of Laterals:
 - 1. Purge all air from laterals and cap all risers. Open valves and bring system to available static line pressure. Lateral lines will be visually reviewed. Lines that exhibit visible leakage shall be rejected.
 - 2. Rejected systems or portions of system shall be repaired and retested until testing requirements are met. Do not request retest until satisfied that system will pass testing requirements.
 - 3. Plug all test cocks on double-check valves after testing by Water Department. Plugs shall be brass and threads shall be sealed with Teflon tape.

3.12 SPRINKLER HEADS

- A. Install pop-up sprinklers flush with finish grade in landscape areas. Adjust radii of sprinklers to obtain optimum coverage.
- B. Backfill around heads shall be approved native or import topsoil, well compacted. Sprinklers shall be installed flush with sidewalks and curbs and no closer than three inches (3") from any paved edge. All heads shall be set perpendicular to finish grade unless otherwise specified on the plans. Refer to details.
- C. Thoroughly flush lines before installing sprinkler heads.
- D. Refer to installation details on Drawings for all sprinkler heads.

3.13 SPRINKLER AND QUICK COUPLING VALVE SWING JOINTS (RISERS)

- A. On spray and quick coupling valve flexible swing joints, apply two wraps of Teflon tape around threaded outlet connection (to sprinkler or quick coupling valve). Threaded connections shall be watertight. Do not over tighten.

3.14 VALVE BOXES

- A. Install valve boxes plumb and flush with finish grade, so that a reel type mover may pass over without interference. Box shall be supported on continuous brick foundation per detail. Valve box archway shall not rest on piping – provide a minimum of one-inch (1”) clearance around any piping.
- B. Provide filter fabric cover over all below grade openings to prevent debris from contaminating the drain rock.
- C. If construction debris washes into the automatic valve or quick coupling valve boxes prior to project completion, remove existing gravel and replace with new gravel.

3.15 BACKFILLING

- A. Backfill:
 - 1. After system is operating and the required tests and review have been made, backfill excavations and trenches with the specified backfill.
 - 2. Backfill when PVC pipe is not in an expanded condition due to heat or pressure. Cooling the pipe can be accomplished by operating the system a short time or by backfilling in the early part of the morning.
- B. Compaction:
 - 1. Trenches shall be thoroughly water-settled. No sluicing will be permitted. Trenches shall be backfilled uniform flush with the surrounding grade, raked and rolled with a roller weighing minimum 90 lbs. per linear foot.
 - 2. Trenches or tunnels under roads or paved areas shall be backfilled and tamped with a mechanical tamper in successive 6" lifts.
 - 3. Backfill for all trenches, regardless of the type of pipe covered, shall be compacted to minimum 95% density under pavements, 85% under planted and lawn areas.
 - 4. Dress all areas to surrounding finish grades.

3.16 RESTORATION AND CLEANUP

- A. All roots, rocks and debris shall be removed from site.
- B. Sweep and wash all walks, pavement and steps.

3.17 PERFORMANCE TESTS

- A. Notification: Submit verbal request for reviews to Owner's Representative at least 48 hours prior to anticipated review.
- B. All Performance Tests shall be accomplished prior to installation of any landscape material. Exceptions to this shall be Trees and landscape boulders with approval of Owner's Representative.
- C. Prior to request for preliminary review and Coverage Check, accomplish the following:
 - 1. Complete all work including balancing, adjusting the system (pressure-reducing valves, flow-adjustment keys, nozzles, etc.) to provide optimum coverage without fogging.

2. Adjust sprinkler heads to finish grade as specified.
 3. Clean out all sediment from valve boxes so that drain rock is exposed below bottom of valve, and all wiring (including spare wires) is visible.
 4. Complete the Operations and Maintenance Manual for review by Owner's Representative.
 5. Present Owner's Representative with a preliminary Record Drawing (on paper with pencil) showing location of all changes to Irrigation Plan to facilitate Review and Coverage tests.
 6. Obtain all miscellaneous keys, spare parts and tools required under this contract for review by Owner's Representative and delivery to Owner.
- D. Preliminary Review: Owner's Representative shall review Irrigation system for accuracy of layout to Plan and finish height of sprinkler heads in relation to finish grade and clearance of sprinkler heads from curbs, walks, walls and buildings. In addition all other aspects of finish presentation shall be reviewed prior to placement of landscape material.
- E. Coverage Check: Remove all valve box covers and operate each zone of the system at direction of Owner's Representative. Owner's Representative shall mark with flagging any sprinkler heads not spaced correctly. Large areas not receiving proper coverage shall be identified through similar means. Corrections to layout shall be made accordingly and/or by recommendation of Owner's Representative.

3.18 FINAL INSPECTION

- A. Prior to final inspection of work, Contractor shall have completed all punch list items and shall submit signed and approved sprinkler/plumbing/health/electrical permits as applicable to the work.
- B. At the time of, and as part of, the Final Inspection, conduct a training and orientation session for the Owner covering the operation, adjustment and maintenance of the irrigation system. The Record Drawings and Operations and Maintenance Manual shall be reviewed and all features explained. Notify the Owner in writing two (2) weeks prior to the training and orientation session. The date and time of the session shall be subject to approval of the Owner.
- C. Operations Test: Test is acceptable if system operates through at least one (1) complete cycle in a satisfactory manner, with uniform coverage of areas to be irrigated, and automatic controls functioning properly.
- D. Provide Owner's Representative with complete Mylar Record Drawing for review and approval. Upon approval Contractor shall supply copy of Record Drawing to be attached to Controller cabinet (inside if possible)
- E. Acceptance of work establishes beginning of one (1) year warranty period for irrigation system.

END OF SECTION

SECTION 32 91 13.16 - MULCHING

PART 1 GENERAL

1.1 SCOPE OF WORK

- A. This section includes furnishing and installing mulch throughout all landscape beds.

1.2 SUBMITTALS

- A. One gallon zip-lock bag sample.

PART 2 PRODUCTS

2.1 MULCH

- A. Mulch:
 - 1. Mulch shall be "Dark Fine Mulch", or similar available from Pacific Topsoil at 1733 127th Avenue NE, Bellevue, WA 98005. (425) 337-2700 or approved substitution.
 - 2. The mulch shall be processed to reduce weed seed, pathogens, and deleterious material, "rootable plants" and shall not contain paint, petroleum products, herbicides, fungicides, or other chemical residues that would be detrimental to plant life. Other deleterious material, plastic, glass, metal, or rocks shall not exceed 0.1 percent by weight or volume. Contractor is informed that evidence of "rootable plants" such as equisetum will be caused for Owner's Representative to direct Contractor to completely remove and replace all mulch at no cost to Owner.

PART 3 EXECUTION

3.1 PREPARATION

- A. Review all Topsoil Type A subgrades to verify all landscape beds are 2 and an half inches below pavement edges and top of walls.

3.2 MULCH INSTALLATION

- A. If plants installed before mulch application, Contractor shall take precautions and measures to protect all installed trees, shrubs and groundcovers from the spreading of mulch. Damaged plants will be replaced by Contractor at no cost to Owner.
- B. Install mulch to foot compacted depth of two inches in all landscape beds. Mulch depths shall be a uniform, roller compacted depth and shall be graded to produce a smooth landscape surface.
- C. Apply mulch as necessary to achieve a full two inch depth.

3.3 MAINTENANCE

- A. Contractor shall be responsible to weed and maintain mulched landscape beds to free of weeds to and to assure a full two inches of mulch depth up to and at the time of Final Acceptance.

END OF SECTION

SECTION 32 91 19 - LANDSCAPE GRADING

PART 1 GENERAL

- 1.1 SECTION INCLUDES:
 - A. Final grade topsoil for finish landscaping.
- 1.2 RELATED SECTIONS:
 - A. Section 31 22 13 - Rough Grading
 - B. Section 31 23 17 - Trenching
 - C. Section 31 23 23 - Fill
 - D. Section 32 05 13 - Soils for Exterior Improvements.
 - E. Section 32 93 00 - Plants: Topsoil fill for trees, plants and ground cover.
- 1.3 SUBMITTALS
 - A. Materials Source: Submit name of imported materials source.
- 1.4 QUALITY ASSURANCE
 - A. Furnish each topsoil material from single source throughout the Work.
 - B. Perform Work in accordance with the latest edition of the Washington State Standard Specifications for Road, Bridge and Municipal Construction.

PART 2 PRODUCTS

- 2.1 MATERIAL
 - A. Topsoil: Fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, taken from drained site; free of subsoil, clay or impurities, plants, weeds and roots; minimum pH value of 5.4 and maximum 7.0; organic matter to exceed 1.5%, magnesium to exceed 100 units; phosphorus to exceed 150 units; potassium to exceed 120 units; soluble salts/conductivity not to exceed 900 ppm/0.9 mmhos/cm in soil.

PART 3 EXECUTION

- 3.1 EXAMINATION
 - A. Verify building and trench backfilling have been inspected.
 - B. Verify substrate base has been contoured and compacted.
- 3.2 PREPARATION
 - A. Protect landscaping and other features remaining as final Work.
 - B. Protect existing structures, fences, sidewalks, utilities, paving, and curbs.
- 3.3 SUBSTRATE PREPARATION
 - A. Eliminate uneven areas and low spots.
 - B. Remove debris, roots, branches, stones, in excess of 1 inch in size. Remove contaminated subsoil.
 - C. Scarify surface to depth of 3 inches where topsoil is scheduled. Scarify in areas where equipment used for hauling and spreading topsoil has compacted subsoil.
- 3.4 PLACING TOPSOIL
 - A. Place topsoil in areas where planting, is required. to thickness as scheduled. Place topsoil during dry weather.
 - B. Fine grade topsoil to eliminate rough or low areas. Maintain profiles and contour of subgrade.
 - C. Remove roots, weeds, rocks, and foreign material while spreading.
 - D. Manually spread topsoil close to plant material, and buildings to prevent damage.
 - E. Lightly compact placed topsoil.
 - F. Remove surplus subsoil and topsoil from site.
- 3.5 TOLERANCES
 - A. Top of Topsoil: Plus, or minus 1/2 inch.
- 3.6 PROTECTION OF INSTALLED WORK
 - A. Prohibit construction traffic over topsoil.

3.7 SCHEDULES

A. Compacted topsoil thicknesses:

1. Seeded Grass: 6 inches.
2. Sod: 4 inches.
3. Shrub Beds: 18 inches.
4. Flower Beds: 12 inches.
5. Planter Boxes: To within 3 inches of box rim.

END OF SECTION

SECTION 32 91 19.13 - TOPSOIL PLACEMENT AND GRADING

PART 1 GENERAL

- 1.1 SCOPE OF WORK
 - A. Furnish and Install Topsoil Type A.
- 1.22 REFERENCES
 - A. ASTM D 1557: Method for Laboratory Compaction Characteristics of Soil using Modified Effort.
 - B. WSDOT *Standard Specifications*.
- 1.3 DEFINITIONS
 - A. Percent Compaction: The required in-place dry density of the material, expressed as a percentage of the maximum dry density of the same material determined by ASTM D1557 test procedure.
 - B. Soil Subgrade: The soil surface on which topsoil is placed.
 - C. Finished Grades: The final grade elevations indicated on the Drawings.
 - D. Aesthetic Acceptance of Grades: Acceptance by the Owner in writing of the Aesthetic Correctness of the contours as observed by Owner. Aesthetic Acceptance does not address whether an area drains properly, whether the areas are at the correct elevation, or whether it has been compacted properly.
 - E. Acceptance: Wherever the terms "acceptance" or "accepted" are used herein, they mean acceptance of the Owner in writing.
 - F. Drawings: Contract Drawings, sections, and profiles showing finished surface grades.
 - G. Elements with Fixed Elevations: Paths, paving, concrete pads, headers, footings, foundations, walls, and other structures with fixed-spot elevations.
- 1.4 SUBMITTALS
 - A. Submit product data and 1-gallon zip- lock bag sample of Topsoil Type A.
 - B. Submit 1-gallon sample of each type of soil amendment.
- 1.5 SITE CONDITIONS
 - A. Environmental Protection:
 - 1. Soil Moisture Content: Do not work soil when moisture content is so great that excessive compaction will occur, nor when it is so dry that dust will form in air or that clods will not break readily.

PART 2 PRODUCTS

- 2.1 MATERIALS
 - A. TOPSOIL TYPE A
Topsoil Type A shall consist of a uniform mixture of organic compost (20% by volume), Sandy Loam (40% by volume) and sand (40% by volume). Maximum clay content should be less than 5%.

Sand Gradation	
Sieve size	Percent Passing
3/8"	100
1/4"	99-100
US No. 4	98-100
US No. 8	92-100
US No. 16	82-100
US No. 30	50-80
US No. 50	10-30
US No. 100	0-5
200 wet sieve	0-2

Compost shall Fine Compost in compliance with WSDOTSS 9-14.4(8).

Sandy Loam shall comply with USDA Soil Texture Triangle and shall comply with the following gradation:

Clay	1-5%
Silt	35-45%
Sand	50-60%

Topsoil Type A pH shall be between 5.5 to 7.5 (to be determined by a certified soil testing lab).

Topsoil Type A mixture shall be uniform and free of any contaminants (i.e. weed seed, foreign debris, root-able plant parts, etc.). Soils should also be free of any pesticide residues (to be determined by a certified soil testing lab). Contractor is informed that any evidence of root-able plant parts such as equisetum will result in the complete removal and replacement of all Topsoil Type A. Soil mix shall be stored/covered accordingly to prevent wetting or saturation. Topsoil Type A is to be used in all seed mix #1 and seed mix #2 areas and landscape planter beds.

- C. Grading Equipment: Appropriate size and flexibility to achieve the sculptural forms, profiles, straight slopes, and slope rounding indicated on the Drawings.

PART 3 EXECUTION

3.1 EXAMINATION

A. Subgrade:

1. Verification: Verify that the subgrades have been graded to within one tenth of a foot (minus the topsoil depth) of the grades shown on the Drawings.
2. Aesthetic Acceptance: Verify that Owner has given the subgrade aesthetic acceptance. Do not place topsoil or rototill subgrade until Consultant has accepted subgrade for aesthetic correctness.
3. Notification of Discrepancies: Notify the Owner in writing of any discrepancies.

3.2 SURVEY REQUIREMENTS

- A. Lines and Levels: Establish lines and levels, locate and lay out by instrumentation and similar appropriate means for all planting area finish grades.
- B. General Staking: Provide a sufficient quantity of grade stakes as required to provide minimum depth layer of topsoil.

3.3 PREPARATION

A. Protection of Existing Conditions:

1. General: Use every possible precaution to prevent damage to existing conditions to remain such as structures, utilities, irrigation systems, plant materials and paving on or adjacent to the site of the Work.

B. Surface Preparation:

1. Inspection: Inspect subgrade soil for stones over one inch in diameter, sticks, oils, chemicals, plaster, concrete, and other deleterious materials.
2. Removal: Perform all Work when necessary to remove the deleterious materials before and after subgrade preparation.

3.4 PREPARING SUBGRADE

- A. Prepare subgrade to avoid excessive compaction. If Owner determines that excessive compaction has occurred, it shall be corrected as follows:

1. Scarify with a rototiller to a depth of 8 inches minimum in one direction.
Note: This Work shall occur immediately before Topsoil Placement.

3.5 TOPSOIL PLACEMENT

- A. Type Topsoil A at all seed mix areas and landscape planter beds

1. Place Topsoil Type A evenly over indicated compacted subgrade in seed mix areas to the depths shown on Drawings.

3.6 FINISH GRADING OPERATIONS

- A. General: Grade with uniform slope between points where elevations are given or between such points and existing grades, unless indicated otherwise.
- B. Soil Surface Tolerances
 - 1. Allowances: Make proper allowances for settlement, spoils from plant pits, etc.
- C. Surface Drainage:
 - 1. Slope finish grades to drain surface water away from buildings, walks, paving, and other structures unless otherwise indicated.
 - 2. Slope finish grades to drain surface water to catch basins, area drains or swales as shown on the Drawings.
- D. Depressions and Loose Material: Fill and compact depressions, and remove all loose material to finish surface true to line and grade, presenting a smooth, compacted, and unyielding surface.
- E. Roller Compact with sod roller filled with water. Add Topsoil type A or B as necessary to achieve finish grades.
- F. Excessive Compaction: Rip areas that have become compacted more than 85 percent compaction to a 8-inch depth. Roto-till and blade smooth prior to planting and irrigation.
- G. Topsoil Types A shall be installed two and half inches (1") lower than all adjacent pavement surfaces and top of walls. Grade a 12" wide @ 2%-4% transition from pavements. Transitions shall be graded uniform and smooth with no surface irregularities.
- H. Remove all visible evidence of wood debris and stones from all finish grades and dispose off-site.

3.7 PROTECTION

- A. Contractor is informed that physical and visual damage to any constructed improvement, including equipment wheel/track marks may result in the removal and replacement of damaged improvement, at the sole discretion of the Owner. Contractor shall schedule work and deploy measures to protect all constructed improvements.
- B. Erosion: Correct erosion and siltation damage at no cost to the Owner.
- C. Settlement Repair: Correct settlement within the Warranty period at no cost to the Owner.
- D. Drainage: Keep surface of topsoil in such condition that it will drain readily and effectively.
- E. Materials, Tools, and Equipment: In handling materials and operating tools and equipment, protect the topsoil from damage by laying down planks, plywood, or other accepted protective materials where required.
- F. Vehicular Traffic: Do not allow vehicles to travel in a single track. If ruts are formed, blade the topsoil smooth.
- G. Storage of Materials: Do not store or stockpile materials on topsoil.
- H. Dust Control: Use water trucks or temporary irrigation and take all precautions needed to prevent a dust nuisance to adjacent public or private properties.

3.8 CLEANUP & REMOVAL

- A. Daily: Keep all areas of Work clean, neat, and orderly at all times.
- B. Absolutely no stockpiling of any topsoil on pavement surfaces shall be permitted at any time during construction.
- C. Final: Clean up and remove all excess Topsoil Type A deleterious materials and debris from the entire Work area prior to Final Completion.

END OF SECTION

SECTION 32 92 23 - SODDING

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- A. Work within this section includes:
 - 1. Alternate Bid No. 3 and 4 – Sod in Lieu of Seed Mix.

1.2 SUBMITTALS

- A. Name and location of sod supplier including certification for grass species.
- B. Site supervisor's credentials for approval. Submit information minimum two weeks prior to commencement of work.
- C. Work schedule showing approximate dates for commencement and completion of each item of work. Submit prior to commencement of work.
- D. Copies of all permits and licenses as applicable to work of this contract.
- E. Submit all other required information and documents as requested or specified.

1.3 QUALITY ASSURANCE

- A. Contractor: experienced and knowledgeable in landscape work of contract.
- B. Site Supervisor: competent, experienced and knowledgeable to direct and supervise all staff and work of contract. Supervisor shall possess a Landscape Journeyman Gardner certification or other similar qualification acceptable to Owner or Owner's Representative. Submit supervisor's credentials for Owner or Owner's Representative's approval prior to commencement of work.
- C. Staffing: experienced, competent and trained landscape personnel who will perform all tasks and services in a knowledgeable and professional manner. Workers shall act safely and professionally at all times while working on site. Contractor shall not assign any worker that the Owner or Owner's Representative deems incompetent, careless, insubordinate, or otherwise objectionable to work on site.
- D. Contractor shall be responsible for ensuring that contract specifications are being adhered to. Failure of the Owner or Owner's Representative to immediately reject unsatisfactory workmanship or to notify the Contractor of their deviation from the specification shall not relieve the Contractor of their responsibility to repair and/or replace unsatisfactory work.
- E. Contractor shall obtain approvals as required by contract for suppliers, sub-contractors, and materials.

1.4 EXAMINATION

- A. Contractor shall advise the Owner or Owner's Representative, in writing, of any conditions or defects encountered on site before or during construction upon which the work of this section depends and which may adversely affect its performance.
- B. Commencement of work shall imply acceptance of existing surfaces and conditions and no claims for damages or extras resulting from such conditions or defects will be accepted later, except where such conditions could not have been known prior to commencing work.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Use all means necessary to protect all materials before, during and after installation, and to protect the installed work and materials of other contractors.
- B. Packaged materials shall be delivered in sealed containers clearly marked with contents, weight, analysis and name of manufacturer.
- C. Schedule deliveries in order to keep storage at site to a minimum without causing delays.
- D. Deliver sod to site within 24 hours of being harvested. Install all sod within 36 hours of being harvested.
- E. Dried out, damaged, deteriorated and unhealthy sod is not acceptable. Broken or irregular pieces of sod are not acceptable. Promptly remove all unacceptable sod from site.

1.6 MAINTENANCE PERIOD

- A. Maintain sodded areas from time of sodding until Final Acceptance.
- B. Any incomplete weeks or months of maintenance shall be carried over to the following landscape growing season.
- C. Owner or Owner's Representative reserves the right to extend maintenance period and/or reduce monthly progress payments for maintenance services any time Contractor fails or neglects to provide proper and adequate maintenance services in accordance with contract specifications as determined by Owner or Owner's Representative.

1.7 WARRANTY

- A. Contractor shall provide warranty for all sod, related works and other materials for a minimum period of one year. Warranty period shall commence from date of Interim Acceptance of the landscape portion of Work in Contract].
- B. Owner or Owner's Representative reserves the right to extend Contractor's warranty responsibilities for an additional one year or as determined by Owner or Owner's Representative on all replacement sod where color, growth and development are not sufficient to ensure future survival.
- C. During warranty period, Contractor shall immediately remove and replace all sod which is dead or unhealthy or in unsatisfactory growing condition. Install replacement sod in accordance with contract specifications.
- D. Owner or Owner's Representative shall be sole judge as to condition of sod regarding warranty replacements.

PART 2 PRODUCT

2.1 SOD

- A. Sod: Special Sun Sod obtained from Country Green Turf Farms.
 - 60% Perennial Ryegrass
 - 20% Hard Fescue
 - 20% Kentucky Bluegrass

2.2 FERTILIZING

- A. Apply fertilizer prior to sodding, after final grade is approved by Owner or Owner's Representative.
- B. Apply granular starter fertilizer recommended by Country Green Turf Farms evenly using a calibrated mechanical distributor.
- C. Lightly rake and incorporate fertilizer into topsoil.

PART 3 EXECUTION

3.1 SODDING

- A. During progress of work, Owner or Owner's Representative will inspect Contractor's workmanship and performance to ensure compliance with specifications.
- B. Obtain Owner or Owner's Representative's approval of finish grades, surface flatness and fertilizer application before laying sod.
- C. Firm topsoil placement by rolling before laying sod as necessary. Lightly moisten and rake soil prior to laying sod.
- D. Do not perform work during hot and dry conditions, or when ground is frozen or covered in snow or during times of unfavorable climatic conditions.
- E. Lay sod smooth and even; butt sod pieces close and tight with no open joints visible. Stagger end joints between adjacent rows to avoid continuous seams. Do not stretch or overlap sod pieces.
- F. Finish sod edges at walks, curbs, planting, mulch edges, manholes, and other vertical surface by cutting neatly and fitting tightly to edge and line.

- G. Lay sod smooth and flush with adjoining grass areas, curbs, walk and pavement. Where new sod abuts existing turf, cut edge of existing grass with sharp tool to form a straight line. Level subgrade and butt new sod tight and flush with existing grass. Adjacent to hard surfaces, finish grade of new sod installation shall match finish grade of existing hard surface.
- H. Protect subgrade and sod from damage during installation.
- I. Cut and remove all irregular, unhealthy and thin sections of sod with a sharp knife and install new replacement sod.
- J. Water in sufficient quantities to obtain moisture penetration through sod after laying sod.
- K. After sod and soil have dried from initial watering, roll newly laid sod using a mechanical roller having adequate weight. Roll sod to ensure good contact with topsoil, to eliminate air pockets, remove minor depressions and irregularities, and to form a smooth even surface. Heavy rolling to correct irregularities in grade is not acceptable. Sod adjacent to existing fixtures shall be thoroughly tamped.

3.2 PROTECTION OF SODDED AREAS

- A. Contractor shall provide adequate protection to protect sodded areas from all damage, disturbance, or other construction activity after sodding operations are complete. Remove protection after sod areas are properly established or as directed by Owner or Owner's Representative.
- B. Damaged sod resulting from inadequate protection shall be repaired with topsoil, fertilizer and new sod at Contractor's expense. All damages shall be repaired prior to final acceptance.
- C. Keep site well drained and landscape excavations dry. Remove excess water from sodded areas.

3.3 MAINTENANCE / ESTABLISHMENT

- A. Work of maintenance period shall be performed each week and as frequently during the week to enable the proper establishment of all new sod and other landscaping installed to ensure that required services and tasks are satisfactorily completed and sustainable.
- B. Watering: apply water with sufficient frequency to maintain adequate soil moisture, promote root development and prevent sod shrinkage during maintenance/establishment period. During hot dry weather increase frequency of watering to maintain sod health.
- C. Provide clean water, equipment, water tanker, methods of transportation, hoses, sprinklers, and labor necessary to adequately and efficiently apply water to all sodded areas. Record quantity of water supplied and applied on site in maintenance log.
- D. Supply all necessary equipment, accessories and labor in use of building water sources where available. Operate existing and new irrigation facilities, where applicable, to ensure adequate watering of sodded areas.
- E. Cut grass at regular intervals and maintain at height of 1.5 inches. Do not cut more than 30% of leaf blade at any one mowing. Remove clippings.
- F. Pick and remove all litter, debris, and animal waste from lawn areas before mowing. Dispose of collected debris off site.
- G. Repair areas which show root growth failure, deterioration, bare or thin spots, or which have been damaged by any means or cause, including replacement operations by installing new sod. Ensure all repairs are completed prior to final acceptance.
- H. Correct any erosion and settlement that results from faulty workmanship and/or material. Restore areas by removing sod, adding topsoil as necessary and laying new sod. Repair ruts resulting from maintenance equipment and personnel. Produce a uniformly smooth surface by removing rutted turf areas and placing new topsoil and sod.
- I. Apply second application of slow release granular turf fertilizer five to six weeks after sodding. Postpone fertilizing until spring if application will occur after August 15th.
- J. Apply fertile topsoil to fill all minor open joints to prevent sod edges from drying.
- K. Control weeds, disease, insects and other pests using acceptable integrated pest management practices to reduce pesticide use. However, when necessary, apply

chemical pesticides in accordance with manufacturer's instructions and government regulations.

- L. Repeat rolling of sod as necessary to maintain a smooth grass surface.
- M. Maintenance Inspections: during progress of the maintenance period, the Contractor and the Owner or Owner's Representative will conduct site inspections every 30 days or less to determine whether ongoing maintenance activities have been performed in accordance with specifications. Any maintenance not performed by Contractor in a satisfactory manner shall be immediately completed to Owner or Owner's Representative's satisfaction.

3.4 MAINTENANCE LOG REQUIREMENTS

- A. Maintain and complete a maintenance log for each day of maintenance activity throughout maintenance period.
- B. Submit maintenance log data to Owner or Owner's Representative each week for verification and approval of services performed. Contractor shall ensure maintenance log data is true and accurate. Site supervisor must complete and sign maintenance log.

3.5 FINAL ACCEPTANCE AND TERMINATION OF MAINTENANCE

- A. Owner or Owner's Representative may accept work at end of maintenance period provided:
 - 1. Sod is properly anchored into underlying topsoil, well established, vigorously growing and healthy.
 - 2. Sod is green, even colored, free of weeds and other pests.
 - 3. Sod is free of bare and dead spots, visible joints, ruts, undulations and settlement.
 - 4. Sod areas have been recently mowed and thoroughly watered.
 - 5. Sod areas are clean and free of all debris.
 - 6. Sod areas have received all required applications of turf fertilization.
- B. Contractor shall use specified materials to re-establish sod installations that do not comply with requirements for acceptance and continue with specified maintenance/establishment until deemed acceptable by Owner or Owner's Representative.

3.6 CLEAN-UP AND REPAIRS

- A. During work of contract, keep all hard and soft surfaces clean. Sweep and wash all walkways and other pavement surfaces to maintain clean appearances. Clear soil and rubble from catch basins, manholes, valves and other hard surface features.
- B. Collect all litter and other debris from site during work of contract.
- C. Remove and dispose of excess materials, soil, litter, debris, and grass clippings at approved disposal site. Contractor shall be responsible for all disposal costs.
- D. Repair all damages resulting from Work of this Contract.

END OF SECTION

SECTION 32 93 00 - PLANTS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Conform to the General Conditions, Supplementary Conditions and all other relevant Sections.

1.2 RELATED WORK IN OTHER SECTIONS

- A. Section 32 8000 - Irrigation
- B. Section 32 91 19.13 – Topsoil Placement and Grading
- C. Section 32 91 13.16 – Mulching

1.3 APPLICABLE PUBLICATIONS

- A. The following issues, but referred to hereafter by basic designation only, form a part of this Specification to the extent indicated by the references thereto:
 - 1. AMERICAN STANDARD FOR NURSERY STOCK: ANSI Z60.1-1996.
 - 2. SUNSET WESTERN GARDEN BOOK, Lane Magazine and Book Co., 1996.

1.4 SEQUENCING AND SCHEDULE

- A. Coordinate this work with installation of other site improvements.

1.5 HERBICIDES APPLICATION QUALIFICATION

- A. Applications of herbicides for weed control as may be required shall be made only by an applicator licensed under Washington State Law and as approved by the Owner's Representative.
- B. Provide protective cover and barriers as necessary to prevent damage and staining to all site improvements and off-site structure, facilities and property.
- C. Contractor shall comply with State law and notify Owner with a 72-hour notification of staff, students and parents prior to all herbicide or pesticide applications – new state law. Pesticides and herbicides will be limited to those approved by Portland Parks and Recreation.

1.6 INSPECTION OF PLANT MATERIALS

- A. All plant materials will be inspected by the Owner's Representative prior to planting and all plant materials not meeting specification requirements shall be rejected. A second inspection will occur after all plant materials are planted and may be rejected at that time.

1.7 SUBMITTALS

- A. Submit samples of tree staking materials and tree wrapping paper.
- B. Inspection Certificates
 - 1. All plant material shall meet requirements of state and federal laws with respect to inspection for plant diseases and infestation.
 - 2. Inspection certificates required by law shall accompany each shipment of plant materials and be submitted to the Owner's Representative.

1.8 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Protect, at all times during handling, shipping and storage, from extreme weather conditions, wind, drying of roots or root ball injury.
- B. Plant materials showing damage from shipping or while in storage or during planting shall be rejected by the Owner's Representative and shall be replaced by the Contractor at his own expense.

- C. Store fertilizers in a dry place and protect from intrusion of moisture.

1.9 JOB CONDITIONS

- A. Plant trees, shrubs and ground covers only during periods which are normal for work as determined by the season, weather conditions and accepted practice. Do not plant when there is prolonged freezing weather or when the soil is in a wet or muddy condition.

1.10 PLANT MATERIALS SUBSTITUTION

- A. Plants not specifically named in the plant list will not be accepted unless specifically approved in writing by the Owner's Representative.
- B. Proposed substitutes in each case shall possess the same essential characteristics as the kind of plant actually specified in regard to appearance, ultimate height, shape, habit of growth, general soil and other requirements, and shall be approved by the Owner's Representative.

PART 2 PRODUCTS

2.1 FERTILIZER PLANTING TABLETS

- A. General. Approved brands meeting requirements of applicable state fertilizer law. Uniform in composition and dry. Deliver to the site in original, unopened containers, each bearing manufacturer's guaranteed analysis.
- B. Tablet-form fertilizer for trees and shrubs shall be 21-gram tablets; 20-10-5 slow-release formula, applied at the rate recommended by the manufacturer.
- C. Tablet-form fertilizer for ground covers shall be 5-gram tablets; 20-10-5 slow-release formula applied at the rate recommended by the manufacturer.

2.2 GRANULAR FERTILIZER

- A. After planting top-dress all plants with 16-16-16 granular fertilizer at the following rates:
 - 1. Trees and large shrubs: 3 ounces
 - 2. Small shrubs and ground covers: 1 1/2 ounces.

2.3 TREE STAKING AND TYING MATERIALS

- A. Stake all trees as shown on Details.
- B. Tree shall be tied to stakes with guy staking wire and plastic tubing. Ties shall be long enough to allow a minimum of 6 inches between tree trunk and tree stake.

2.4 TREE WRAPPING

- A. Tree wrapping shall be standard tree wrapping, waterproof, ripple kraft paper, burlap fabric or approved equal.

2.5 WATER

- A. Water shall be suitable for irrigation, free from oil, acid, alkali, salt or other substances harmful to plant life.

2.6 PLANT MATERIAL

- A. General. Genus, species, variety, quantity, size and condition of plant will be provided as indicated on the Drawings and Plant Material List.
- B. Plant material shall be healthy nursery stock, well branched, full foliated when in leaf, free from disease, injury, insects, weeds and weed roots. Cold storage plants will not be permitted.
- C. Bare root stock will be allowed only with written approval from the Owner's Representative.

Potted and container stock shall be well rooted, vigorous enough to ensure survival and exhibit healthy growth.

- D. Plant materials shall be nursery-grown unless otherwise specified or approved by the Owner's Representative. Nursery grown plants shall have been growing continuously in licensed nurseries for the following minimum number of growing seasons:

PLANT MATERIALS

Trees and Shrubs:

Evergreen

Deciduous

Ground Covers

TIME IN NURSERY

Two growing seasons

One growing season

One growing season

- E. Container stock shall have grown in its container for a minimum of 6 months and a maximum of 2 years, with roots filling the containers, but not showing evidence of being or having been rootbound.
- F. All grafts or budding on trees shall be at ground level, unless otherwise specified; higher grafts or budding with compatible trunk and branch growth characteristics may be approved by the Owner's Representative.
- G. All collected native plant materials shall be nursery grown for a minimum of 1 year unless otherwise approved in writing by the Owner's Representative.
- H. Trees. Provide untapped, straight, single leader trees, except for multiple stem (clump) trees.
- I. Plant materials shall be free from disfiguring knots, swollen grafts, sunscale injuries, bark abrasion, evidence of improper pruning and other objectionable disfigurements.
- J. Trees and shrubs shall have well developed branching systems; shrubs shall have full foliage and shall not be leggy.
- K. Thin, weak and leggy plants will be rejected by the Owner's Representative.
- L. Labels. The correct horticultural name, size and caliper, and/or other data, as specified in the Plant Material List, written on durable labels in weather resistant ink, shall be securely attached to all individually shipped plants and to each box, bundle, bale and container of plant materials. Labels shall remain on the plant materials until final acceptance of the planting. Labels shall be affixed in such a manner that will not girdle the plant materials. Plants not labeled as specified will not be accepted.
- M. Substitutions. If all other requirements are met, container grown plants may be furnished instead of balled and burlapped. However, balled and burlapped plants may not be substituted for container grown plants. Substitutions shall be made only with approval of the Owner's Representative at no change in the contract price.
- N. Plants required. The species (botanical and common names), size, manner in which the plants are to be furnished, and an indication of the number required to complete the planting are noted in Specifications and Planting Plans. The number of ground covers, although noted on the Drawings, shall be determined in accordance with the spacing specified on the Drawings or in the Specifications. Surplus or shortages of plant materials will not be justification for additional compensation.

2.7 PLANT STARTER SOLUTION

- A. Plant starter solution shall, when mixed according to the manufacturer's recommendations, be a high-nutrition plant food which contains water soluble hormone-like materials that are easily and

readily absorbed into the roots and which stimulate early and rapid root development and reduce transplant shock when applied to the plant root zone. The solution shall include chelated iron, manganese and zinc-trace mineral supplements available in a formulation which will match the needs of a wide range of plant types, and shall be approved for use on edible crops in the United States. Solution shall not be damaged by freezing, reduced in nutrients due to leaching or runoff, possess any ingredient that will cause solidification, be affected by soil pH or bacterial action, nor be harmful to wildlife. Plant starter solution will not be applied to plant foliage as a fertilizer or plant food.

PART 3 – EXECUTION

3.1 INSPECTION

- A. Verify that planting bed grades are in accordance with those indicated on the Drawings before proceeding with work.
- B. Soil Condition
 - 1. Examine planting areas for conditions that will adversely effect execution, permanence, and quality of work and survival of plant materials.
 - 2. Planting work shall not begin until soil and planting conditions are satisfactory to the Owner's Representative.

3.2 LAYOUT AND PLANT LOCATION

- A. Layout of the planting areas, as indicated on the Drawings, are approximate only and must be verified by the Owner's Representative.
- B. The Contractor shall notify the Owner's Representative forty-eight (48) hours prior to beginning any planting. The Owner's Representative may adjust plant material location to meet field conditions. Planting shall not occur until the Owner's Representative has approved the location and layout of all plant beds.

3.3 PLANTING OF TREES, SHRUBS AND GROUND COVER

- A. Plant trees and shrubs upright and face to give best appearance or relationship to adjacent plants and structures. Shrubs and ground covers shall be planted one-half the distance from curbs, sidewalks, building and other objects, as specified in the spacing requirements.
- B. Excavation for planting.
 - 1. Stockpile all acceptable topsoil excavated within the area.
 - 2. Topsoil Type A shall be required in the plant pits. In digging pits, the Contractor shall separate sod, top soil suitable for backfill, and subsoil, and shall dispose of the sod, rocks and unsuitables.
 - 3. Plant pits shall have vertical sides and flat bottoms. All plant pits for trees shall be a minimum of two feet greater than the root ball.
 - 4. All planting beds shall have all objectionable weeds or grasses removed and disposed of off site.
 - 5. If unremovable underground obstructions or rocks are encountered in excavation of planting areas, another location for the planting may be selected by the Owner's Representative.
 - 6. Acceptable excess of excavated topsoil shall be used to form saucers around plants as detailed. It may be wasted over nearby waste areas. Excess soil not required or suitable for the above usage shall be properly disposed of off the project site.
- C. Prior to placing plant into the plant pit, the root ball shall be dipped in appropriate size container of plant starter solution, or the plant starter solution may be sprayed or poured over the entire root ball per the manufacturer's specifications.

- D. Placement of Trees. Hand-firm mound placing tree in tree pit, remove burlap from around at least upper 1/3 of root ball. Pulling burlap from under ball will not be permitted on large or loose root balls.
 - E. Cutting. Cut off cleanly all broken or frayed roots.
 - F. Placement and compaction. Place and compact backfill soil mixture carefully to avoid injury to roots; fill all voids.
 - G. Watering. When hole is nearly filled with prepared topsoil, completely flood the plant pit and allow water to soak away. Fill holes to finish grade. Provide saucer for trees and shrubs as detailed and as approved.
- 3.4 FERTILIZER PLANTING TABLETS
- A. Place fertilizer tablets per manufacturer's recommendation in holes formed with the end of a broom handle or other suitable device. Evenly space the tablets around perimeter of, and immediately adjacent to, the root system at a depth that is between the middle and the top of the root system.
- 3.5 GRANULAR FERTILIZER
- A. After planting topdress all plants with 16-16-16 granular fertilizer at the specified rate. Apply the width of the root ball.
- 3.6 SHRUBS AND GROUND COVER PLANTING BED GRADES
- A. Establish finish grades and slopes in accordance with finish grades as indicated on the Drawings and as specified.
 - B. Plant shrubs as shown on the Drawings and similar to tree plantings. Plant each ground cover plant into a plant pit which is at least 12 inches wider than the plant's root ball.
 - C. Establish grades 1/2 inches below adjacent bordering paving, curbs, walks, drains, and extruded concrete curbs before application of mulch.
- 3.7 MULCHING
- A. Mulch all ground cover planting beds with 2 inch layer of mulch material within two (2) days after planting. Cover entire bed areas; apply evenly. Do not cover branches with bark.
- 3.8 STAKING, TYING AND WRAPPING TREES
- A. Stake and tie trees immediately after planting as indicated on the Detail Drawings.
 - B. Drive stakes into the ground as shown on the Drawings. Do not injure root ball.
 - C. Stake all trees except as otherwise indicated.
 - D. Promptly after planting, the trunks of deciduous trees of 1 inch caliper and larger shall be completely, spirally wrapped from the second lowest branch. Wrap downward to the ground, overlapping half of each spiral to form a double thickness. Wrapping shall be secured in place with twine wrapped spirally from the ground to the point above the second lowest branch.
 - E. Wrapping shall not be started until inspection and approval of the plants by the Owner's Representative.
- 3.9 EVERGREEN TREES
- A. All evergreen trees shall be thoroughly sprayed with an antidesiccant prior to transplanting and delivery from the nursery. All applications of the antidesiccant shall be made prior to transplanting. The antidesiccant shall not be applied if rain is anticipated in one hour or less. If

not previously applied to shrubs, and/or ground covers, the Contractor shall, within 24 hours of completing backfilling, spray all evergreen and leafed-out deciduous shrubs and ground covers with the antidesiccant, thoroughly covering all leaves. The solution shall be mixed according to manufacturer's recommendations.

3.10 PRUNING

- A. Pruning shall be done as directed and under the direction of the Owner's Representative. Pruning shall be limited to the minimum necessary to remove injured twigs and branches and to compensate for the loss of roots during transplanting, but never to exceed 1/4 of the branching structure. Crossed or rubbing branches shall be removed providing the natural shape of the tree is preserved. All cuts shall be made flush with the parent stem leaving no stubs. Pruning cuts shall be made in a manner to favor the earliest possible covering of the wound by callus growth. Cuts, which produce large wounds and weaken the tree, will not be acceptable.
- B. Evergreens shall not be pruned except to remove injured branches and/or double leaders. All trimmings and other debris left over from the pruning operations shall be collected and disposed of off the site.

3.11 CLEAN-UP

- A. Keep premises reasonably free from accumulation of debris.
- B. At completion of each area of work, remove all debris, equipment and surplus materials.

3.12 PLANT ESTABLISHMENT AND MAINTENANCE PERIOD

- A. The plant establishment period shall start immediately after all plants are planted and written notification is received by the Owner and the Owner's Representative that all plants are planted, and extend for ninety (90) days following completion of all planting operations and acceptance by the Owner's Representative.
- B. Until the end of the plant establishment and maintenance period, the Contractor is responsible for caring for planting areas and maintaining plants in a vigorous growing condition by:
 - 1. Weeding.
 - 2. Repairing and adjusting tree stakes and guys.
 - 3. Apply wound dressings.
 - 4. Pruning to remove suckers.
 - 5. Protecting with antidesiccant.
 - 6. Removing dead and unhealthy plants not showing vigorous growth and replacing them with healthy plants during appropriate planting season. (The location of the moved material shall be staked when immediate replanting is not feasible).
 - 7. Straightening up plants or adjusting plants when settled.
- C. Inspection shall be performed at least once a month during the plant establishment and maintenance period to detect any disease or insect pest. The Contractor shall identify, or have identified the nature or species of the infestation and submit the proposed methods of control to the Owner's Representative for approval. Control measures shall be applied as approved.
- D. Repair of topsoil, bark and planting areas. When any portion of the lawn areas and planted areas become gullied or otherwise damaged, the affected portion shall be repaired to the condition originally specified for the area.
- F. Replacement:
 - 1. During the guarantee period, plants that die or are, in the opinion of the Owner's Representative, in an unhealthy, unsightly or badly impaired condition, or fail to show signs of vigorous life, shall be replaced by the Contractor as soon as is reasonably possible after the unsatisfactory condition has become evident, at no additional cost to the Owner.

2. No replacement shall be made during any season definitely unfavorable for planting.
3. At the conclusion of the plant establishment and maintenance period, an inspection will be made by the Owner's Representative upon written notice requesting inspection, submitted at least ten (10) calendar days prior to the anticipated date.
4. The purpose of the inspection shall be for the acceptance of the contract work, including maintenance.
5. If there are any deficiencies in the maintenance, the Contractor shall be notified and the work will be subject to re-inspection before acceptance. Maintenance of the replacements will be by others after the plant maintenance period.

3.13 GUARANTEE

- A. The guarantee of all plant materials furnished and planted under this Contract shall be for one full year from the completion date of the establishment period. Although not responsible for maintenance of the plant material during the guarantee period, the Contractor should, for his own interest, assure himself that minimum care is being given to the plant materials, as he is liable for their health during the guarantee period. Should Owner fail to maintain plants and evidence of wide spread plant death related to insufficient watering where previously noted as healthy plant material, Contractor shall not be liable. At the end of the guarantee period, the Owner's Representative will make another inspection to determine the condition of the plants. All plants not in a healthy growing condition, as determined by the Owner's Representative, will be noted and as soon as seasonal conditions permit, shall be removed from the site and replaced with plants of the same species and size as originally specified. Such replacement shall be made in the same manner as specified for the original plantings, and at no extra cost to the Owner. The Contractor is not responsible for vandalism.

END OF SECTION

SECTION 33 11 16 - SITE WATER DISTRIBUTION

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes pipe and fittings for water transmission line and valves.
- B. Section includes water meter setters, meter boxes, and hydrants assemblies

1.2 RELATED SECTIONS

- A. Section 32 05 16 - Aggregate Materials.
- B. Section 31 23 17 - Trenching.

1.3 REFERENCES

- A. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.
- B. ASTM 2922 - Test Methods for density of soil and soil aggregate in place by nuclear methods (Shallow depth).
- C. AWWA C600 (American Water Works Association) -Installation of Ductile-Iron Water Mains and Appurtenances.
- D. AWWA C104 (American Water Works Association) -Cement mortar lining for ductile iron pipe and fittings for water.
- E. AWWA C111 (American Water Works Association) - Rubber gasket joints and grey iron pressure pipe and fittings.

1.4 SUBMITTALS

- A. Per "Submittal Procedures" Section: Submittal procedures.
- B. Product Data: Submit data on pipe materials, pipefittings, valves, meters, vaults, hydrants, backflow devices, fire department connection, post indicator valves, and accessories.

1.5 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of piping mains, valves, connections, thrust restraints, and invert elevations.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with WSDOT Section 7-11, 7-12, and 7-14 and the Silverdale Water District's standards and requirements.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store valves in shipping containers with labeling in place.

PART 2 PRODUCTS

2.1 WATER PIPE

- A. Ductile Iron Pipe: Materials shall meet the requirements of WSDOT Section 9-30.1 in conformance with AWWA C151 and AWWA C104 for Class 50 or 52 pipe as required.
- B. Ductile fittings: Materials of standard thickness shall meet the requirements of WSDOT Section 9-30.2 in conformance with AWWA C110 and AWWA C153.
- C. Ductile Iron Joints: Non-restrained rubber gasketed joints shall meet the requirements of WSDOT Section 9-30.1(1) in conformance with AWWA C111.
- D. Steel Pipe: materials shall meet the requirements of WSDOT Section 9-30.1(4)A and B in conformance with ASTM A120.
- E. Steel Fittings: Materials shall meet the requirements of WSDOT 9-30.2(4)B in conformance with ASTM A 47, Grade 32510 and ANSI B16.3. Threads shall meet the requirements of ANSI B2.1.
- F. Copper Tubing: Materials shall meet the requirements of WSDOT Section 9-30.6(3)A in conformance with ASTM A 120.

2.2 GATE VALVES - 3 INCHES AND OVER

- A. Gate Valves: Valves shall meet the requirements of WSDOT 9-30.3 in conformance with AWWA C500 or AWWA C509 and shall be iron body, bronze trim, non-rising stem with square nut, single wedge, resilient seat, flange or mechanical joint as indicated on the plans.

2.3 BEDDING AND COVER MATERIALS

- A. Bedding: Fill Type as specified in Section 320516 Aggregates.
- B. Cover: Fill Type, as specified in Section 320516 Aggregates.

2.4 HYDRANT

- A. Hydrant Assembly: Hydrants shall meet the requirements of WSDOT 9-30.5 in conformance with AWWA C502 and UL 246.
- B. Hydrant Extensions: Fabricate in multiples of 6 inches with rod and coupling to increase barrel length.
- C. Hose and Streamer Connection: Match sizes with applicable local fire department standards, two hose nozzles and one "Storz" pumper nozzle.
- D. Finish: Primer and two coats of enamel in color required by the local fire department standards.

2.5 ACCESSORIES

- A. Concrete for Thrust Restraints: Class 3000 or commercial class concrete, WSDOT Section 6-02.3(2) B.
- B. Domestic Service Assembly: as indicated on the plans.
- C. Tapping Sleeve: cast iron split sleeves and split tee, Clow F-1268 or equal, size as indicated on the plans.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Administrative Requirements: Coordination and project conditions.
- B. Verify and coordinate connection to the existing transmission water main.

3.2 PREPARATION

- A. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, remove burrs.
- B. Remove scale and dirt on inside and outside before assembly.
- C. Prepare pipe connections to equipment with flanges or unions

3.3 BEDDING

- A. Excavate pipe trench in accordance with WSDOT Section 7-10.
- B. Form and place concrete for pipe thrust restraints at change of pipe direction. Place concrete to permit full access to pipe and pipe accessories.
- C. Place bedding material at trench bottom, level fill materials in one continuous layer not exceeding 6 inches compacted depth; compact to 95 percent dry density.
- D. Backfill around sides and to top of pipe with cover, fill, tamp in place and compact to 95 percent dry density.
- E. Maintain optimum moisture content of fill material to attain required compaction density.

3.4 INSTALLATION - PIPE

- A. Maintain separation of water main from sewer piping in accordance with Washington State Department of Health requirements.
- B. Install pipe to indicated elevation to within tolerance of 5/8 inch.
- C. Install ductile iron piping and fittings to AWWA C600 and in conformance with WSDOT Sections 7-08, 7-09, 7-10, and 7-11, and 7-12 and Silverdale Water District's standards and requirements.
- D. Route pipe in straight line.
- E. Install pipe to allow for expansion and contraction without stressing pipe or joints.

- F. Install access fittings to permit disinfection of water system.
- G. Slope water pipe and position drains at low points.
- H. Form and place concrete for thrust restraints at each elbow or change of direction of pipe main.
- I. Establish elevations of buried piping with not less than 3 feet of cover. Provide fittings as necessary to perform vertical adjustments in pipe to conform to finish grades.
- J. Install trace wire continuous over top of pipe, buried 6 inches below finish grade.
- K. Plugs and Connections for branches, stubs, or other open ends, which are not to be immediately connected, shall be made in conformance with WSDOT Section 7-08.3(2) F. Contractor is to clearly mark the ends of the pipe stubbed onto the future lots with 2 x 4's, painted white, with the black stenciled letters labeling the pipe "water". A measure down distance to the pipe invert is to be provided on the 2 x 4.

3.5 INSTALLATION – VALVES, HYDRANTS, AND VAULTS

- A. Set valves on solid bearing.
- B. Center and plumb valve box over valve. Set box cover flush with finished grade.
- C. Set hydrants plumb, locate "Storz" pumper nozzle perpendicular to and facing roadway.
- D. Set hydrants to grade with nozzles at least 20 inches above grade.
- E. Provide drainage pit 36" square by 24" deep filled with 2 inch minus washed rock. Encase elbow of hydrant in gravel to 6" above the drain opening. Do not connect drain opening to sewer.
- F. Paint hydrants in accordance with applicable Local Fire District standards.
- G. Hydrants are to be installed in conformance with WSDOT Section 7-14 and valves are to be installed in conformance with WSDOT Section 7-12.
- H. Backflow preventers shall be inspected by a certified backflow prevention specialist prior to acceptance by the Owner.

3.6 DISINFECTION AND TESTING OF DOMESTIC WATER PIPING SYSTEM

- A. The water pipes and appurtenances shall be disinfected in accordance with WSDOT Section 7-11.3(12) and the APWA Standard Specifications.
- B. The Contractor shall obtain samples and submit them to the Silverdale Water District.
- C. The water main will not be accepted by the Owner until the Silverdale Water District approves of the samples.
- D. Upon completion of installing the water main pipe, valves, and appurtenances, the Contractor shall test the system. It is the Contractor's responsibility to insure the adequacy of the system. Pipelines shall be filled at a rate of 1 cubic foot per second (450 gallons per minute) or less. The Contractor shall allow 15 minutes from having the pipe full in order to purge it of air.
- E. Contractor shall perform hydrostatic pressure testing per WSDOT Standard Specification Section 7-09.3(23).

3.7 FIELD QUALITY CONTROL

- A. Compaction Testing: In accordance with ASTM D1557.
- B. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

END OF SECTION

SECTION 33 31 00 - SANITARY SEWAGE SYSTEMS

PART 1 GENERAL

1.1 SELECTION INCLUDES

- A. Sanitary sewage piping, manholes, fittings, accessories, and bedding.
- B. HDPE sanitary sewer force main.
- C. Duplex Lift Station in H-20 rated Basin

1.2 RELATED SECTIONS

- A. Section 32 05 16 - Aggregate: Aggregate for backfill in trenches.
- B. Section 31 23 16 - Excavation: Product and execution requirements for excavation and backfill required by this section.
- C. Section 31 23 17 - Trenching: Execution requirements for trenching required by this section.
- D. Section 31 23 23 - Fill: Requirements for backfill to be placed by this section.

1.3 REFERENCES

- A. ASTM A746 - Standard Specification for Ductile Iron Gravity Sewer Pipe.
- B. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.
- C. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- D. ASTM D3034 - Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- E. ASTM D3350 – HDPE Pipe

1.4 SUBMITTALS

- A. Product Data: Submit data indicating pipe material used, pipe accessories, and fittings.
- B. Manufacturer's Installation Instructions: Indicate special procedures required to install Products specified.

1.5 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record location of pipe runs, connections, manholes, cleanouts, and invert elevations.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with WSDOT 7-08 and 7-17 and Kitsap County Sanitary Sewer Utility and Health Department Standards.

1.7 COORDINATION

- A. Coordinate the Work with termination of sanitary sewer connection outside building.

PART 2 PRODUCTS

2.1 SANITARY SEWAGE PIPE

- A. Ductile Iron Pipe: ASTM A746, AWWA C151, Gravity Sewer Pipe Class 50, conforming to WSDOT 9-05.13. Inside nominal diameter and outside drop connection fabrication as indicated on the plans.
- B. Plastic Pipe: ANSI/ASTM D3034, SDR 35 Tpe PSM Poly Vinyl Chloride (PVC) material conforming to WSDOT 9-05.12. Inside nominal diameter as indicated on the plans, bell and spigot style solvent sealed joint end.
- C. HDPE Sanitary sewer force main pipe: WSDOT 9-05.2, SDR 17.
- D. Fittings:
 - 1. Ductile iron fittings – materials of standard thickness shall meet the requirements of WSDOT 9-30.2 in conformance with AWWA C110 or C153.

2. PVC Fittings: Same material as pipe, shall be injection molded, factory welded, or factory solvent cemented to suit pipe size and end design, in required tee, bends, elbows, cleanouts, reducers, traps and other configurations required.
 - E. Accessories:
 1. Ductile Iron Joints. Material shall meet the requirements of WSDOT 9-05.13 in conformance with AWA C-111 using rubber gasketed joints.
 2. PVC Joints. Material shall meet the requirements of WSDOT 9-05.12 in conformance with ASTM D3212 using restrained gasket conforming to ASTM F477.
 3. Trace Wire: Magnetic detectable conductor with brightly colored plastic covering.
- 2.2 MANHOLES
- A. Manholes: in conformance with WSDOT Section 7-05.
- 2.3 BEDDING AND COVER MATERIALS
- A. Bedding as specified in Section 32 05 16.
- 2.4 CLEANOUTS
- A. Cleanouts: in conformance with WSDOT Section 7-19.
- 2.5 DUPLEX LIFT STATION
- A. Lift Station fittings, pump, system, switches, and control panel to be Weil provided by Columbia Hydronics Company (Gary Fox 206-431-7692) or equal. Pump to be a Weil Model 2516C-2 sized for 50 GPM at 88' TDH with 5HP/3450/208-230/60/3 explosion proof motors or equal.
 - B. Installation provided by contractor per manufacturer's recommendations.
 - C. Basin to be provided by contractor, and must be H-20 rated sized for Duplex pumps, with capacity per plumber requirements.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verification of existing conditions before starting work. Verify trench cut and excavation base is ready to receive work and excavations, dimensions, and elevations are as indicated on drawings.

3.2 PREPARATION

- A. Correct over excavation with coarse aggregate or lean concrete.
- B. Remove large stones or other hard matter which could damage pipe or impede consistent backfilling or compaction.

3.3 BEDDING

- A. Excavate pipe trench in accordance with Section 31 23 17 and WSDOT Section 2-09 and 7-08.3(1) C.
- B. Place bedding material at trench bottom, in accordance with WSDOT Section 7-08.3(1) C. Level materials in continuous layer not exceeding 8 inches, compact to 95 percent. Maintain optimum moisture content of bedding material to attain required compaction density.

3.4 INSTALLATION - PIPE

- A. Install pipe, fittings, and accessories in accordance with WSDOT Section 7-08 and 7-17. Seal joints watertight.
- B. Lay pipe to slope gradients noted on drawings; with maximum variation from indicated slope of 1/8 inch in 10 feet.
- C. Install bedding at sides and over top of pipe to minimum compacted thickness of 12 inches, compact to 95 percent.
- D. Refer to Section 31 23 23 for Backfilling and Section 31 23 17 for Trenching requirements. Do not displace or damage pipe when compacting.

- E. Connect to municipal sewer system at locations shown on the plans.
- F. Install trace wire continuous over top of pipe, buried 6 inches below finish grade, above pipeline.
- G. Install Work in accordance with WSDOT Section 7-08 and 7-17 and Kitsap County Sanitary Sewer Utility and Heath Department Standards.
- H. Plugs and connections for pipe branches, stubs, and other open ends which are not to be immediately connected shall be performed per WSDOT Section 7-08.3(2) F. Contractor is to clearly mark the ends of the pipe stubbed onto the future lots with 2 x 4's, painted white, with the black stenciled letters labeling the pipe "SEWER". A measure down distance to the pipe invert is to be provided on the 2 x 4.
- I. At locations where existing sanitary sewer pipes and mains are to cut and abandoned, plugging of the existing pipe shall be accomplished in conformance with WSDOT Section 7-08.3(4).

3.5 INSTALLATION – MANHOLES

- A. Excavate for manholes in accordance with Section 31 23 16 and WSDOT Section 2-09.3(4).
- B. Form bottom of excavation clean and smooth to correct elevation.
- C. Form and place cast-in-place concrete base pad, with provision for sanitary sewer pipe end sections.
- D. Establish elevations and pipe inverts for inlets and outlets as indicated on Drawings.
- E. Mount lid and frame level in grout, secured to top cone section to elevation indicated. All joints within the manholes are to be filled and sealed with grout.
- I. Install Work in accordance with WSDOT 7-05 and Kitsap County Sanitary Sewer standards.

3.6 FIELD QUALITY CONTROL

- A. Submittals per "Quality Requirements" Section: Field inspecting, testing, adjusting, and balancing.
- B. Request inspection prior to and immediately after placement of bedding material.
- C. Perform test on site sanitary sewage system in accordance with WSDOT Section 7-17.3(2).
- D. Compaction Testing: In accordance with ASTM D1557 and ASTM D 2922.
- E. When tests indicate Work does not meet specified requirements, remove work, replace and retest at no additional cost to the Owner.
- F. Cleaning of sanitary sewer main is to be accomplished per WSDOT Section 7-17.3(2)

3.7 PROTECTION OF FINISHED WORK

- A. Protecting finished Work from damage. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress. Contractor is to repair and/or replace work that has been damaged prior to owner's acceptance.

END OF SECTION

SECTION 33 41 00 - SITE STORM SEWERAGE SYSTEMS

PART 1 GENERAL

- 1.1 SECTION INCLUDES
 - A. Site storm sewerage drainage piping, fittings, accessories, and bedding.
 - B. Catch basins and site surface drainage.
 - C. Erosion Control Facilities.
 - D. Filterra
- 1.2 RELATED SECTIONS
 - A. Section 31 22 13 - Rough Grading: Excavation, embankment and compaction.
 - B. Section 31 23 17 - Trenching: Trenching and backfilling for storm site piping and catch basins.
- 1.3 SUBMITTALS
 - A. Material product data.
- 1.4 REFERENCES
 - A. AASHTO M36 - Metallic (Zinc or Aluminum) Coated Corrugated Steel Culverts and Underdrains.
 - B. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.
 - C. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
 - D. AASHTO M252 - Corrugated Polyethylene drainage Tubing 3 inch to 10-inch diameter.
 - E. AASHTO M294 - Corrugated Polyethylene drainage Tubing 12 inch to 36-inch diameter.
- 1.5 REGULATORY REQUIREMENTS
 - A. Conform to WSDOT Section 7-04, Section 7-05, and 7-08 for applicable code for materials and installation of the Work of this section.
- 1.6 COORDINATION
 - A. Coordinate work with other trades.

PART 2 PRODUCTS

- 2.1 SEWER PIPE MATERIALS
 - A. Corrugated Steel Pipe: Steel storm sewer pipe shall meet the requirements of WSDOT Section 9-05.1(2) in conformance with AASHTO M36.
 - B. Coupling Bands: Steel coupling bands shall be of consistent base metal as pipe and shall meet the requirements of WSDOT Section 9-05.1(2) A.
 - C. Corrugated Polyethylene (PE) Pipe and Fittings: PE pipe and fittings shall meet the requirements of AASHTO M294, Type S Smooth Internal Wall (ADS N-12) or equal.
 - D. Corrugated Polyethylene (PE) Tubing and Fittings: PE non-perforated and perforated tubing and fittings shall meet the requirement of AASHTO M252.
 - E. Concrete Pipe: Plain concrete storm sewer pipe shall conform to the requirements of AASHTO M 86, Class 2 as stated in WSDOT Section 9-05.7(1).
 - F. Concrete Storm Sewer Joints: All concrete storm sewer pipes shall be joined with rubber gaskets. The joints and gaskets shall meet the requirements of AASHTO M 198. Gasket material shall be stored and handled in accordance with Section 9-04.4(5).
- 2.2 ACCESSORIES
 - A. Grout: Specified in WSDOT Section 9-11.3.
 - B. Geotextile Fabric: Temporary silt fence as specified in WSDOT Section 9-33, Table 6.

3.4 INSTALLATION - PIPE

- A. Install pipe, fittings, and accessories in accordance with WSDOT Section 7-08 and manufacturer's instructions. Seal joints watertight.
- B. Lay pipe to slope gradients noted on drawings with maximum variation from true grade of 1/8 inch in 10 feet.
- C. Install aggregate at sides and over top of pipe. Provide top cover to minimum compacted thickness of 12 inches, compact to 95 percent. Refer to Section 31 23 17 for trenching requirements. Do not displace or damage pipe when compacting.
- D. Plugs and connections for pipe branches, stubs, or other open ends, which are not to be immediately connected, shall be performed in conformance with WSDOT Section 7-08.3(2) F. Contractor is to clearly mark the ends of the pipe stubbed onto the future lots with 2 x 4's, painted white, with the black stenciled letters labeling the pipe "STORM". A measure down distance to the pipe invert is to be provided on the 2 x 4.
- E. Where existing storm drainage pipes are cut and abandoned at the locations shown on the plans, plugging of existing pipes is to be performed in conformance with WSDOT Section 7-08.3(4).

3.5 INSTALLATION - CATCH BASINS, CONTROL STRUCTURES, AND CLEANOUTS

- A. Form bottom of excavation clean and smooth to correct elevation.
- B. Perform the installation of catch basins and control structures in accordance with WSDOT Section 7-05.
- C. Establish elevations and pipe inverts for inlets and outlets as indicated.
- D. Mount lid and frame level in grout, secured to top cone section to elevation indicated. All joints within the catch basin are to be grouted.
- E. Abandoning existing manholes and catch basins is to be accomplished in conformance with WSDOT Section 7-05.3(2).

3.6 FIELD QUALITY CONTROL

- A. Field inspection and testing shall conform to WSDOT Section 7-04.3(1).
- B. Request inspection prior to and immediately after placing aggregate cover over pipe.
- C. Compaction testing will be performed in accordance with ASTM D1557 and ASTM D2922.
- D. If tests indicate Work does not meet specified requirements, remove work, replace and retest at no additional cost to the Owner.

3.7 PROTECTION

- A. Protect finished Work from damage. If damaged the contractor shall repair damage at no additional cost to the Owner.
- B. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.
- C. At the completion of the work and prior to final inspection, the storm sewer system is to be cleaned per WSDOT 7-07.

END OF SECTION